

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

Vol. 67: No. 2. New York, Thursday, January 10, 1901.

\$5.00 a Year, including Postage.  
Single Copies, Ten Cents.

Reading Matter Contents.....	page 56
Alphabetical Index to Advertisers ..	139
Classified List of Advertisers.....	141
Advertising and Subscription Rates ..	71



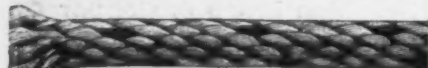
**IRON AND STEEL**  
**REPUBLIC IRON & STEEL COMPANY**  
CHICAGO, ILL. \*  
**PRODUCTS**



**THE BRISTOL COMPANY,**  
Waterbury, Conn.  
**Bristol's Recording Instruments.**

For Pressure, Temperature and Electricity.  
Silver Medal, Paris Exposition.  
All Ranges, Low Prices, and Guaranteed. Send for Circulars.

**SAMSON SPOT CORD**



Also Massachusetts and Phoenix Brands of Sash Cord.

**SAMSON CORDAGE WORKS, Boston, Mass.**

**TURNBUCKLES.**



Branch Office, 11 Broadway, New York.  
Cleveland City Forge and Iron Co., - Cleveland, O.

**TURNBUCKLES.**

**MERRILL BROS.,**  
405 to 471 Kent Ave.,  
Brooklyn, E.D., N.Y.

**BESSEMER PIG.**

**PILLING & CRANE** Girard Building, Philada.  
Lewis Block, Pittsburgh.

If it pays to employ good men and to use good tools, it pays to give them good stock; Apollo galvanized iron.

**American Sheet Steel Company**  
Battery Park Building  
New York

## TRAP SHOOTING



**Remington HAMMERLESS GUNS**

A CATALOGUE WILL BE SENT ON APPLICATION



**Remington Arms Co. ILION NEW YORK**

Agencies  
313 Broadway - New York - 425 Market St. - San Francisco

## CAHALL BOILERS See Page 98.

### CAPEWELL HORSE NAILS.

NEW YORK,  
PHILADELPHIA,  
CHICAGO,  
ST. LOUIS,  
BOSTON,  
DETROIT,  
CINCINNATI,  
SAN FRANCISCO,  
PORTLAND, ORE.,  
BUFFALO,  
BALTIMORE,  
NEW ORLEANS.

**BRANCHES:**

**THE CAPEWELL HORSE NAIL COMPANY,**  
HARTFORD, CONN.



## Jenkins Bros.' Valves

are manufactured of the best steam metal, and are fully guaranteed. Why experiment with cheap valves? If you want the **BEST** ask your dealer for valves manufactured by Jenkins Brothers. Remember all genuine are stamped with Trade Mark like cut.

**JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston.**

**Brass Prices High, So Use Bright "Swedoh" Stamp- ing Steel. Easily Brass Plated and Save Money. See page 130**



## MAGNOLIA METAL.

Best Anti-Friction Metal for all Machinery Bearings.

Fac-Simile of Bar.  
Beware of Imitations.



**MAGNOLIA METAL CO.,** 266 and 267 West St., London, Chicago, Montreal, Pittsburgh.  
Owners and Sole Manufacturers. NEW YORK. Boston, San Francisco, Philadelphia.

LIBRARY OF CONGRESS  
JAN 11 1901

THE  
**ANSONIA BRASS**  
AND **COPPER CO.**  
MANUFACTURERS OF  
**BRASS AND COPPER**  
Seamless Tubes, Sheets, Rods and Wire.

**Ingot Copper**

SOLE MANUFACTURERS

**Tobin Bronze**

(TRADE-MARK REGISTERED.)

Condenser, Plates, Pump Linings, Round,  
Square and Hexagon Bars, for Pump  
Piston Rods and Bolt Forgings.

9 John Street, - - New York.

**Randolph-Clowes Co.,**

Main Office and Mill,  
**WATERBURY, CONN.**

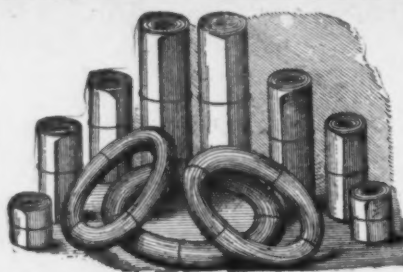
MANUFACTURERS OF

**SHEET BRASS & COPPER.**

**BRAZED BRASS & COPPER  
TUBES.**

**SEAMLESS BRASS  
& COPPER TUBES  
TO 36 IN. DIAM.**

New York Office, 253 Broadway, Postal Tel-  
egraph Bldg., Room 202.  
Chicago Office, 602 Fisher Bldg.  
Boston Office, Cor. Oliver and Purchase Sts.



**Waterbury Brass Co.**

Established 1845.

**Sheet, Roll and Platers' Brass,**

German Silver, Copper, Brass and Ger-  
man Silver Wire, Brass and  
Copper Tubing.

**COPPER RIVETS AND BURS.**

**TAPE MEASURES,  
METALLIC EYELETS,**

Brass Kettles, Brass Tags, Powder Flasks,  
Shot Pouches, &c.,

AND SMALL BRASS WARES OF EVERY DESCRIPTION  
*Cartridge Metal in Sheets or Shells  
a Specialty.*

DEPOTS:

60 Centre St., New York. 125 Eddy St., Provi-  
dence, R. I. 38 Mechanic St., Newark, N. J.

MILLS AT WATERBURY, CONN.

**DEOXIDIZED ORDNANCE and  
COMPOSITION METALS**

of all descriptions.  
Satisfactory prices.

**BRIDGEPORT DEOXIDIZED BRONZE  
& METAL CO.,  
BRIDGEPORT, CONN.**

**THE PLUME & ATWOOD MFG. CO.,**

MANUFACTURERS OF

**Sheet and Roll Brass**

—AND—

**WIRE**

PRINTERS' BRASS, JEWELERS' METAL, GERMAN  
SILVER AND GILDING METAL, COPPER RIVETS  
AND BURS.

Pins, Brass Butt Hinges, Jack Chain, Kero-  
sene Burners, Lamps, Lamp  
Trimmings, &c.

29 MURRAY ST., NEW YORK.

144 HIGH ST., BOSTON.

199 LAKE ST., CHICAGO.

ROLLING MILL:  
THOMASTON, CONN.

FACTORIES:  
WATERBURY, CONN.

**SCOVILL MFG. CO.,**

Manufacturers of

**BRASS**

SHEET, WIRE, TUBES.

Hinges, Buttons, Lamp Goods,  
Nipples, Pumps and Oilers  
for Bicycles, Braziers'  
Soldier.

FACTORIES, WATERBURY, CONN.

DEPOTS:

NEW YORK, CHICAGO, BOSTON.

**JOHN DAVOL & SONS,**

AGENTS FOR

Brooklyn Brass & Copper Co.,

DEALERS IN

**COPPER, TIN, SPELTER,  
LEAD, ANTIMONY.**

100 John Street, - New York.

**Arthur T. Rutter,**

SUCCESSOR TO

**WILLIAM S. FEARING,**

256 Broadway, New York.

Sheet Brass, German Silver, Cop-  
per, Brass and German Silver  
Wire, Brazed and Seamless  
Brass and Copper Tubes, Small  
Tubing a Specialty. Brass and  
Copper Rods, Brass Ferrules.  
Sheet and Ingot Copper; Spelter,  
Tin, Antimony, Lead, etc.

**THE BRIDGEPORT BRASS CO.,**

BRIDGEPORT, CONN.

19 Murray St., New York.

85-87 Pearl St., Boston.

17 N. 7th St., Philadelphia.

MANUFACTURERS OF

**Brass  
AND  
Copper**

**SHEET  
TUBING  
WIRE.**

Lamp Goods of all Kinds.

**BRASS AND COPPER GOODS**  
In Great Varieties.



**Matthiessen & Hegeler Zinc Co.,**

LA SALLE, ILLINOIS.

**SMELTERS OF SPELTER**

AND MANUFACTURERS OF

**SHEET ZINC AND SULPHURIC ACID.**

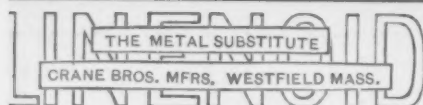
Special Sizes of Zinc cut to order. Rolled Battery Plates.  
Selected Plates for Etchers' and Lithographers' use.  
Selected Sheets for Paper and Card Makers' use.  
Stove and Washboard Blanks.

**ZINCS FOR LECLANCHE BATTERY.**

**BRASS FOUNDERS  
FINISHERS J.J. RYAN & CO.**

68-74 West Monroe St., Chicago.

Best Bronze, Babbitt Metals, Brass and Aluminum CASTINGS  
On Short Notice.



No better counter  
made.

4 Wheel, \$3.00

5 Wheel, \$3.25

Guaranteed.

R. A. HART, BATTLE CREEK, MICH.

**HENDRICKS BROTHERS**

PROPRIETORS OF THE

**Belleville Copper Rolling Mills,**

MANUFACTURERS OF

**Braziers' Bolt and Sheathing**

**COPPER,  
COPPER WIRE AND RIVETS.**

Importers and Dealers in

Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.  
49 CLIFF ST., NEW YORK.









# THE IRON AGE

THURSDAY, JANUARY 10, 1901.

## Direct Connected Steam Engines and Generators.—II.

[BY FRANK C. PERKINS, BUFFALO, N. Y.

(CONCLUDED.)

The latest central station equipments, both in America and Europe, consist of very large and economical direct connected engines and generators. Horizontal and vertical compound and triple expansion engines are now

extensively used, operating polyphase alternators of capacities many times those installed a few years ago. The tendency of modern central station development has been toward larger electrical units installed in a single centrally located plant with transmission of energy at high potentials to substations where a distribution is made to the regular working potentials. Probably nowhere in the world is this tendency more striking than when looking over the high power engines and polyphase gener-

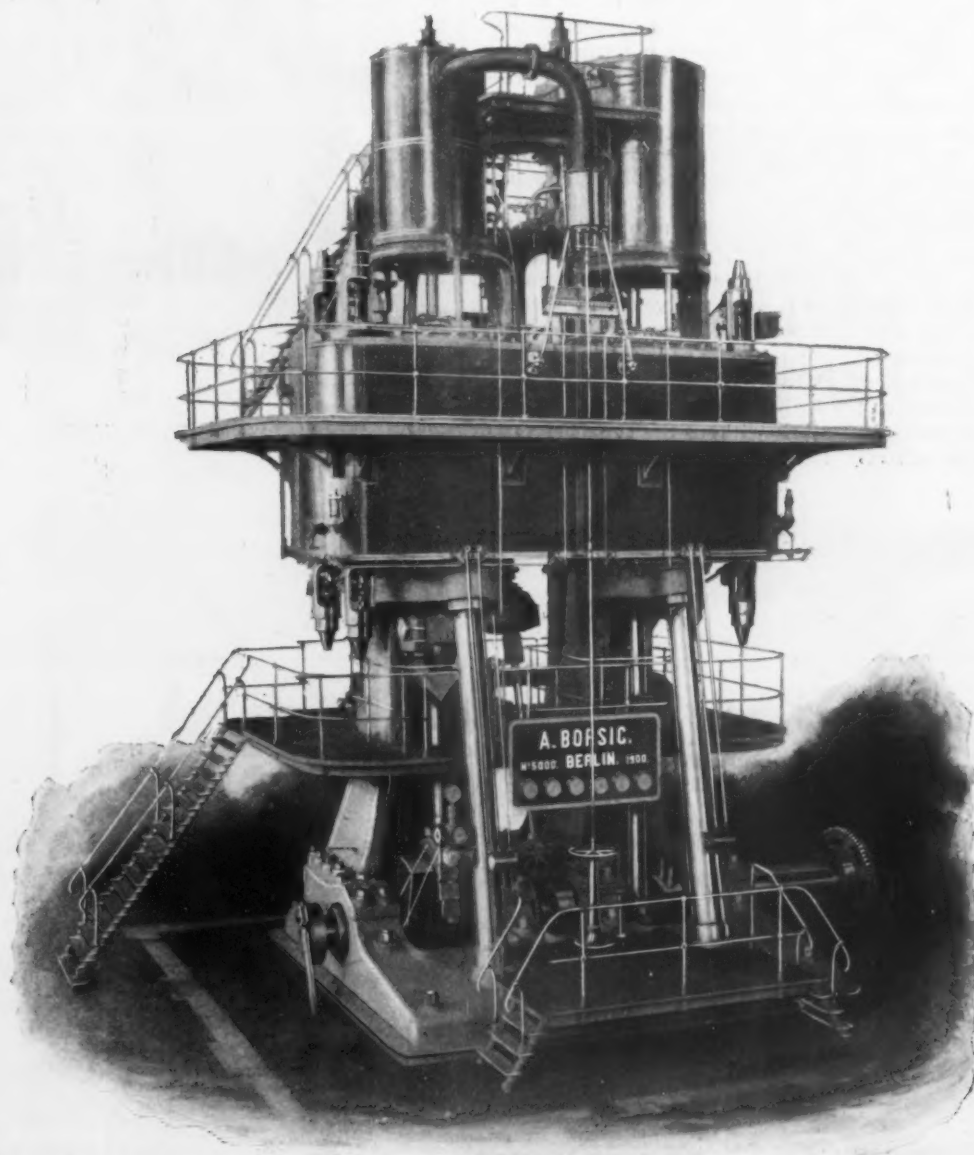


Fig. 13.—German Triple Expansion Engine.

### DIRECT CONNECTED STEAM ENGINES AND GENERATORS.

ators exhibited at the Paris Exposition. After considering a few of the existing plants at home and abroad using these large generators it may be of interest to note some of the larger units of the leading manufacturers

extensively used, operating polyphase alternators of capacities many times those installed a few years ago. The tendency of modern central station development has been toward larger electrical units installed in a single centrally located plant with transmission of energy at high potentials to substations where a distribution is made to the regular working potentials. Probably nowhere in the world is this tendency more striking than when looking over the high power engines and polyphase gener-

abroad exhibited at Paris and soon to be installed in actual working installation in various parts of the world.

The larger connected engines and polyphase generators now being installed not only result in a direct higher economy at the power house but the distribution necessarily covers greater distances, and with higher voltages, increasing the total economy of the plant. With the introduction of polyphase currents, substations are found necessary for transforming the current from

high potential to low potential by static step down transformers, and in many cases from an alternating current to a direct current by means of rotary converters for special uses of street railway, light and other power work.

There are three particular cases which may be considered where high power direct connected engines and alternating current generators are used for supplying current for lighting and power circuits in large cities.

The first case consists of a central station using large polyphase generators direct connected to compound and triple expansion engines, both of the vertical and horizontal type, where the current is generated at low or moderate voltages. Step up static transformers are used for increasing the pressure for the transmission line to very high potentials of 10,000 volts or more, step down static transformers being required at substations for obtaining a low pressure alternating current for use in the vicinity of that substation. In such a case at least 3 kw. of machinery must be installed at the central power house and substation in order to deliver 1 kw. to the consumer. The efficiency of such a system must necessarily be comparatively low, probably not over 80 per cent., even if rotary transformers are not found necessary, direct currents not being required in that locality.

The high efficiency of the large direct connected units and other circumstances, such as cost of land for central station should it be necessary to place the same in the business portion of a large city, would, however, undoubtedly bring the total economy to a higher point than in the third case considered. A second case would consist of a central power house and substations as before, but the two-phase or three-phase generators would be of the revolving field type directly connected to single high power compound or triple expansion condensing engines, these generators in this case delivering the alternating current at the high potentials of 5000 or 10,000 volts to the transmission line without the use of step up transformers, directly from the stationary armatures.

ers would be avoided as well as the first cost of this machinery. Here the investment for generating and distribution apparatus would be lowered, only 2 kw. being required for each kilowatt delivered to the consumer.



Fig. 14.—French Engine.

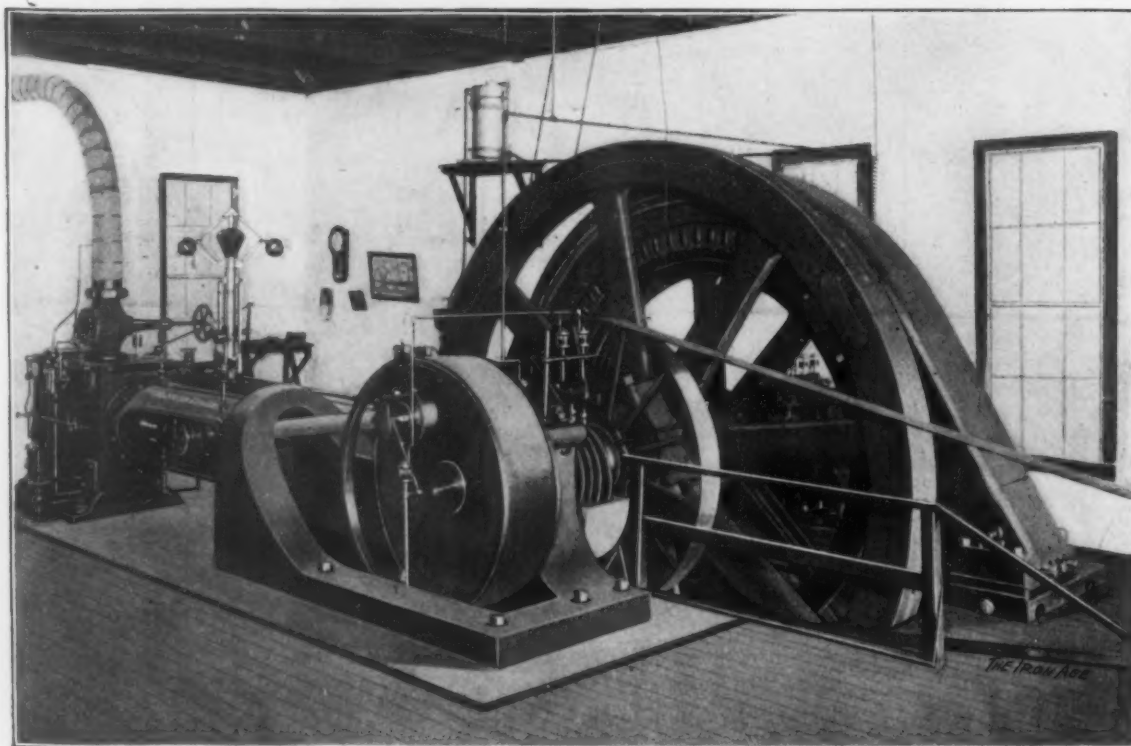


Fig. 15.—Hamilton-Corliss Engine.

#### DIRECT CONNECTED STEAM ENGINES AND GENERATORS.

The only additional transformation here being necessary would be that at the substations where the step down transformers are located. The efficiency in this case would probably be increased from 80 per cent. to probably 85 per cent., as the losses in the step up transform-

The latest designs of high tension polyphase alternators are very satisfactory, and under certain conditions this method will undoubtedly be largely used in the near future in this country and abroad.

The last case considered is the central station, now

being largely used when large generators are direct connected to engines of great economy, the current being supplied directly to the consumer. This means an investment in machinery of simply 1 kw. capacity for each kilowatt delivered to the user. The efficiency in this case may be increased to as high as 90 per cent. for the entire output.

The first cost, however, of the central station here required may be very much higher on account of expensive locations and number of complete power houses required to deliver the same amount of current over an equal area as that considered in the first two cases.

It may be of interest to consider one or two central stations at home and abroad using high power engines direct connected to the latest type of alternators.

The Wandsworth and St. Luke's stations of the County of London Electric Company are examples of English central stations using alternating single phase and poly-phase currents. In the main engine room there are five single phase alternators of the Mordey type directly coupled to cross compound marine engines having Raworth fly wheel governors. The engine room is 60 feet wide and 180 feet long. The girders carry the two 20-ton cranes which convey any piece of machinery to or

a speed of 83 revolutions per minute. The generator has a stationary armature and a revolving field which acts as a fly wheel for the engine. In addition to the fly wheel effect of the revolving field of the dynamo an additional fly wheel has been provided weighing  $41\frac{1}{2}$  tons placed between the engine and the generator. The main bearings are about 15 inches in diameter, and the length of the four bearings in the bed plate is about 9 feet. The bearing between the fly wheel and generator is about 4 feet long and nearly 20 inches in diameter. The crank pins are about 16 inches in diameter and 17 inches long. There are two 14-inch solid steel rods which aid in the support of the guide. The main frame consists of heavy iron box pillars supporting the guide for slides. All the cylinders are steam jacketed and two single acting air pumps are utilized, one delivering and the other drawing at the same time. The stroke is about 10 inches, and the buckets nearly 4 feet in diameter. The buckets are supplied with 19 valves, each 4 inches in diameter, and there are 24 delivering valves for each pump. On the end of the main shaft is an overhung crank disk. From the pin of this disk a connecting rod is operated which oscillates a rocking shaft driving the pumps.

An injection type of condenser is used. The base

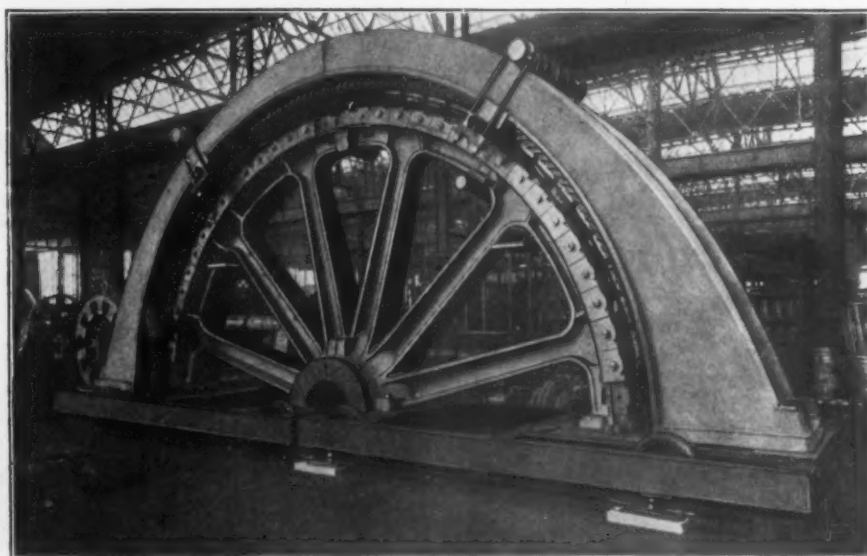


Fig. 16.—Half of German Generator.

#### DIRECT CONNECTED STEAM ENGINES AND GENERATORS.

from the landing stage to its appointed place in the engine room. It was found impossible to utilize the whole space for generating sets, and it was decided to put two landing stages on the road level, the floor of the engine room itself being at the same level as the floor of the stoke room. In the engine room there are two centrifugal pumps driven by steam engines and one motor driven centrifugal pump for supplying circulating water, which is drawn from the canal at the southern end of the building and discharged at the northern end. Close by one of the landing stages are three steam driven exciters, two of the Electrical Construction Company's make and one of the Brush Company's manufacture. There are six 200-kw. two-phase, 50 generators, built by the Electric Construction Company of Wolverhampton. There are also two cross compound engines of the E. P. Allis & Co.'s make directly connected to 550-kw. General Electric generators installed by the British Thomson-Houston Company.

##### German Triple Expansion Engine.

The German and French engine manufacturers are not behind the English in the introduction of high power engines, both of the triple expansion and compound condensing types.

The Borsig vertical triple expansion engine seen in Fig. 13 is directly connected to a Siemens & Halske alternator of a capacity of 2500 horse-power, operating at

plate is built in two parts, each carrying two of the crank bearings, while the central part is hollowed out in the form of a trough to collect the droppings of oil, which are pumped up into a purifier by two small rotary pumps receiving their power from the main shaft by small steel wire ropes. At the right in illustration may be seen a toothed ring, to which an electric motor is geared, for starting the engine.

The high pressure cylinder piston is fitted with Ramsbottom cast iron rings, and the medium cylinder piston and low pressure cylinder pistons are supplied with Buckley rings of the latest pattern.

Collmann's design of dash pots are fitted to the double beat valves, which regulate the steam to all the cylinders. The valve motion is driven from a shaft carried on six bearings behind the low pressure cylinders, all of the eccentrics being mounted on this shaft. Oil is forced under pressure into all the stuffing boxes. An oil distributor is placed on the upper platform and supplies oil to all the rods and bearings.

The exciter, which supplies direct current to the revolving field of the three-phase alternator, is an eight-pole continuous current dynamo, having a capacity of 214 amperes at 210 volts potential at the speed of the engine, 83 revolutions per minute. This does not represent the capacity of the generator at higher speeds. The field of the three-phase alternator has 64 pole pieces. The pole pieces are constructed of sheet iron fastened together by



bolts, and a steel bar holds the same to the cast iron fly wheel rim. The field winding consists of flat copper wound edgewise with air insulation. The stationary armature is wound with copper bars, insulated with mica. The armature laminated iron is held in place by castings, which are fastened to supporting rims. The inner and outer rings are made in several parts and bolted together and held rigidly by strong spokes.

#### French Engine.

The Delaney-Bellville engine is shown in Fig. 14. This engine was shown in the French section of the Paris Exposition, and was of great interest to engineering visitors. It is of the inclosed type and of comparatively high speed, operating at 250 revolutions per minute. At this speed, working under a moderate steam pressure, the engine develops 1250 horse-power. The piston speed is 230 m. per minute, and the stroke is 460 mm. The diameter of the high pressure cylinder is 550 mm., and the intermediate and low pressure cylinders are 820 mm. and 850 mm. in diameter respectively. One

nator. The exciter is connected outside on the main engine shaft.

A still higher power engine of the horizontal type is necessary to run a 3000-kw. polyphase alternator of the Allgemeine Electricitäts Gesellschaft of Berlin. The illustration, Fig. 16, shows the upper half of this high generator. It is intended to operate by a four-cylinder horizontal engine at a speed of 83 revolutions per minute and will require an engine capacity of 4000 horse-power. This generator has a revolving field magnet, which acts as a fly wheel for the engine. It has a peripheral speed of about 32 m. per second. On the circumference are fastened 72 poles of iron plates. The field coils are excited by a direct current machine, whose output is about 24 kw., the excitation current being less than 1 per cent. of the total capacity of the machine.

The stationary armature of the 3000 kw. alternator, built by the Allgemeine Electricitäts Gesellschaft, is wound star fashion and calculated for a potential in each phase of 3460 volts. This corresponds to an intermeshed potential of 6000 volts, the current strength being 290

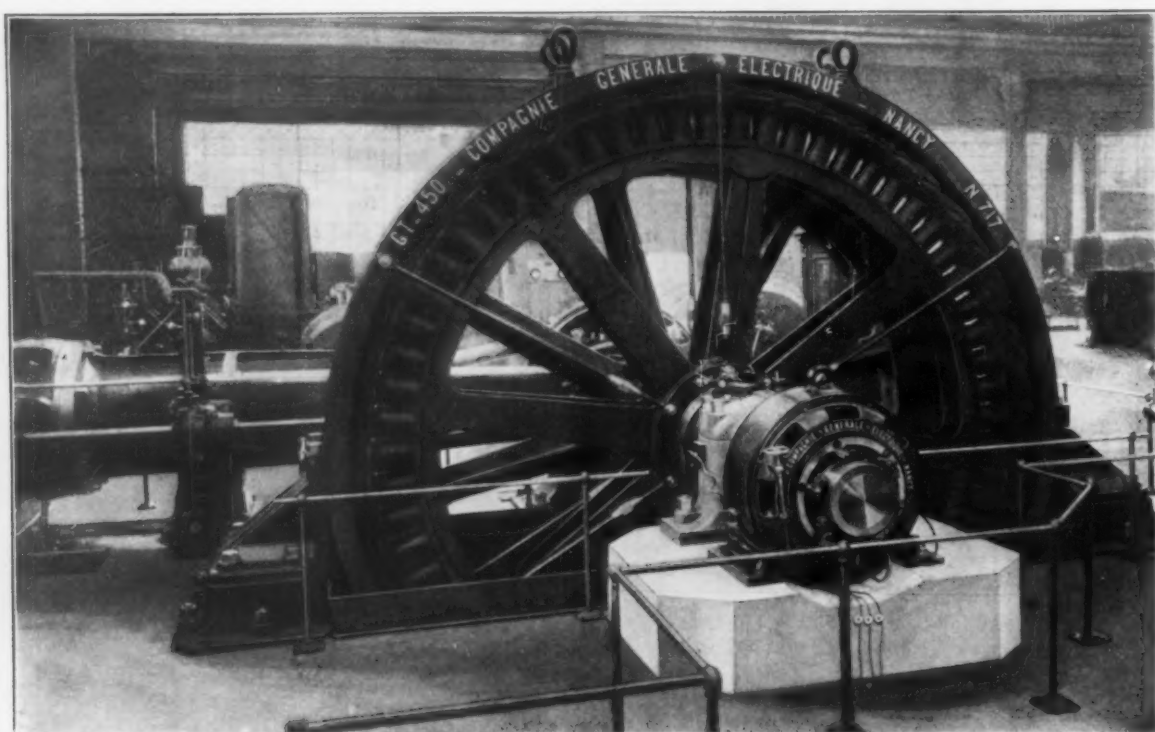


Fig. 17.—High Power Horizontal Engine.

#### DIRECT CONNECTED STEAM ENGINES AND GENERATORS.

of the special features of this engine is the lubricating system. It has an oscillating pump which forces the lubricant to the various bearings under a 150-pound pressure, which insures perfect lubrication for every part of the engine.

#### American and Foreign Engines.

It may be of interest to contrast some of the high power direct connected engines at the Paris Exposition, used to operate polyphase alternating current machines, with those of American construction. The illustration, Fig. 15, shows a Hamilton horizontal Corliss engine direct connected to American type of alternator.

The three-phase alternator exhibited by Electricite & Hydraulique of Charleroi is direct connected to a horizontal compound engine built by Bollinckx of Bruxelles. It weighs 42,000 kg., and the inductor revolves at the rate of 94 turns per minute. Sixty-four pole pieces are arranged on the fly wheel field magnet, and the frequency of the alternator at the above speed is 50 periods per second. The current generated is 250 amperes at a potential of 2000 to 2200 volts.

The Lang horizontal engine, built at Budapest, is direct connected to a 1200 kw. Ganz Tarsa polyphase alter-

amperes per phase. The winding is of the drum type, solid bars being connected by fork pieces and insulated with micanite, a single rod of copper being imbedded in each groove and held in place by a dovetail wedge.

The forks are insulated by the use of a wide air gap. At 6000 volts potential and at a normal speed of 83 revolutions for the revolving fly wheel magnets, this armature generates a polyphase current whose frequency is 6000 alternations per minute.

The high power horizontal engine shown in Fig. 17 operates a three-phase machine, designed by the Compagnie Generale Electrique of Nancy. The revolving field magnet acts as a fly wheel for the engine, and has a speed of 93.5 revolutions per minute. This inductor consists of a steel ring, cast with eight arms and carrying 64 inducing poles screwed to the ring. The weight of the inductor is 9600 kg. The exciter is a six-pole machine, furnishing a direct current at a potential of 120 volts.

It has an armature, which is held rigidly in place by six rods of forged iron terminating at a collar piece and can be adjusted by locking screws. This armature has the appearance of great lightness, and the gross weight of the cast part is greatly reduced relatively to the active

weight of the plates of the armature. It has an inside diameter of 4.5 m. and an outer diameter of 5050 mm., while the thickness of the frame is 580 mm. It has 96 coils placed in 384 openings, of which 32 are connected in series to form one phase.

The total weight of the armature is 14,000 kg. The current generated is 87 amperes, and has a frequency of 50 periods per second, while the total output is about 450 kw. The engine is required to deliver from 530 to 660 horse-power, according to whether the load on the alternator is inductive or noninductive.

## The Ship Subsidy Bill.

### The Advantageous Position as Unfinished Business Lost.

WASHINGTON, D. C., January 8, 1901.—The unpromising conditions that have surrounded the ship subsidy bill since the first week of the present session culminated on the 3d inst., upon the reconvening of Congress after the holidays, in the formal displacement of the measure from its advantageous position of "unfinished business," and it will now require a majority vote of the Senate to bring it up for consideration. In view of the fact that at least a majority of the Senate favor the general proposition of a subsidy law it would not be safe to say that the present measure is dead, but its most sanguine friends are greatly discouraged at the outlook.

The bill became the "unfinished business" with the beginning of the present session, the managers of the Nicaragua Canal bill, which had the right of way, granting it precedence in order to prevent a conflict between the two measures. Several days' discussion of the bill developed the fact that even its friends were at variance upon its exact provisions, and when it was laid aside informally from time to time attempts were made to harmonize existing differences. When the holiday recess was taken it was hoped that the advocates of a subsidy law would seize the opportunity to thoroughly canvass the provisions of the pending bill and unite upon a series of amendments that would enable them all to support the measure without too radical modifications.

When the Senate reconvened on the 3d inst. it was found that very little progress had been made toward harmonizing different interests, and especially that Western Senators, who had visited their constituencies during the recess, were less than ever disposed to aid in pushing the bill. The crisis came on the first day after the recess when the army reorganization bill was under consideration. The hour of two o'clock having arrived, the Senate under the standing rule would have taken up the subsidy bill as "unfinished business," but Senator Hawley of Connecticut undertook to have it informally laid aside, to which Senator Pettigrew, who has strongly opposed the subsidy bill from the outset, objected; and a *viva voce* vote being taken, the Senate formally decided to displace the shipping bill and continue the discussion of the army bill. This action not only displaced the subsidy bill from its position as "unfinished business," but reduced it to the level of scores of other important measures for which but little time is left in the 50 legislative days of the session which now remain.

Senators Hanna and Frye, who have made the fight for the ship subsidy bill, are not willing to concede its defeat, and it is quite probable that they will succeed in bringing it forward again by shrewd parliamentary tactics. They cannot do so, however, in opposition either to the army bill or to any one of the important appropriation bills, none of which have yet been disposed of, and several of which are ready to be brought into the Senate on short notice.

### The Expenditure Involved.

Much of the opposition to the subsidy bill has grown out of the statements of its opponents concerning the amount to be expended under its provisions. These estimates are declared by the friends of the bill to be excessive, and in this connection Senator Frye has prepared the following statement:

"The maximum annual expenditure is fixed at \$9,

000,000 by the first section of the bill. The seventeenth section provides that vessels receiving the benefits of this act shall carry the mails free. During the fiscal year ended June 30, 1897, we paid American vessels \$1,278,674 for carrying the foreign mails. During 1898 and 1899 our mail steamships were extensively employed as cruisers, transports, &c. During 1898 we entered, however, into a contract for a mail service to Jamaica, involving \$122,000. Under normal conditions our annual pay to American vessels for mail service will be \$1,400,000, and any slight extension will increase this amount to \$1,500,000. These mail services will be continued in any event. From the \$9,000,000 maximum expenditure must be deducted \$1,500,000, which is not dependent on this measure, leaving the actual new expenditure proposed \$7,500,000.

"Some years must elapse before this maximum will be attained, depending on the extensions and multiplication of our shipyards. An estimate of the Treasury Department, based on our actual navigation for the calendar year 1899, indicates an initial new expenditure of \$2,600,000 in round numbers, conditioned on the subsequent building of about 400,000 tons of new shipping in American yards, at an expenditure for labor and material of over \$40,000,000. The time which must elapse before the annual new expenditure of \$2,600,000 (or \$4,000,000, including present mail pay) shall become \$7,500,000 (or \$9,000,000, including mail pay) is conjectural."

### Cheap Tonnage for Farm Products.

Senator Frye has also been at some pains to meet the allegations of certain Senators that the bill would not favorably affect agricultural interests by supplying cheap tonnage for exported farm products. Senator Butler of North Carolina, who has agitated this phase of the subject vigorously since the bill came before the Senate, makes his point in the following terms:

"Among the principal factors which operate to advance or decline the prices of agricultural staples there is none more potent than the price of ocean freight. To illustrate: A Liverpool buyer in our market desires, say, to land wheat in Liverpool at \$1 a bushel. Should the ocean freight be 1 cent a bushel to Liverpool, the exporter will deduct 1 cent from the Liverpool price for freight. Should the freight be 5 cents or 10 cents or 20 cents a bushel, the exporter will deduct 5 cents or 10 cents or 20 cents a bushel. Now, let it be observed that the more the exporter deducts the less the farmer will receive, not alone for the quantity which the farmer then sells, but for all the remainder which the farmer may then have on hand, whether it is to be exported or whether it is to be sold for home use.

"Now that the matter has been clearly defined, the question properly presents itself: Will the proposed subsidy to shipping tend to decrease the price of ocean freights, or will it tend to increase it? That this subsidy measure is not intended to decrease ocean freight charges is evident, for its main purpose is not to do the foreign carrying trade at the 'pauper' labor rates of foreign competitors, but the driving away of these competitors so as to permit the protected ship owner to raise ocean freights high enough to enable them, as they claim, to pay their sailors 'protected American wages,' and incidentally earn for themselves, in increased profits, the reward of 'protected' American capital."

In opposition to this view Senator Frye describes the advantages that will accrue to agriculture, as follows:

"This bill is primarily for the benefit of our exports, and as agriculture, in bulk and value, furnishes much the greater part of our exports, the bill is essentially a bill to promote the exports of agriculture. And as the most promising field for the future development of our markets for agricultural products is northern and temperate Asia, the committee believes that it is within bounds to affirm that our grain fields and cotton plantations will gain in greater proportion from its enactment than the seaboard shipbuilding and ship owning States, whose benefits from its enactment are, to the casual eye, more clearly manifest.

"It requires at the present time about 4,200,000 gross tons of shipping steadily employed throughout the year and making repeated voyages to conduct our ocean trans-



portation, and this tonnage earns, as stated, approximately \$175,000,000. Upon the increase of American shipping, which must in a few years follow the bill, a saving of \$25,000,000 annually in ocean export freights can be predicted, and at the end of ten years, with a steadily increasing volume of ocean trade, the committee believes the proportionate annual saving will be much greater. By this saving is meant the saving to our exporters, whether of agricultural or manufactured products. To it may be added the national saving from the development of the shipbuilding and ship owning industries and industries dependent upon or created by them, the enlarged field for labor, and, above all, the sense of increased national maritime strength and independence."

The most conservative friends of the shipping bill are inclined to think that its fate in the present Congress will be determined in such a manner within the next three weeks as to leave no question in the minds of its friends or foes. Unless it can be restored to the position of "unfinished business" within that time, it is believed it will be abandoned for the present Congress. W. L. C.

### Plastic Pressure Tube Expander.

The method of expanding the tubes of boilers by means of a taper mandrel and rollers, which has for many years been the one system adopted by engineers, is now face to face with a rival which will, states *Engineering*, from which we quote, prove powerful and may perhaps supplant the older method almost entirely. This system is one by which tubes are expanded by plastic pressure, and is the invention of C. V. Burton of the Newall Engineering Company, Limited, 141 Queen Victoria street, E. C., London, and the tool by which the operation is performed is shown by the annexed illustrations, Fig. 2 being a longitudinal section and Fig. 3 a transverse section through S S. As shown, it is supposed to be in the act of expanding a tube. The principle on which the action of the tool depends is the plastic property possessed by some metals, and particularly lead, by which they flow when subjected to pressure; and this property

tube as far as it will go. The lead bush now fills pretty completely the space between the inside of the tube and the mandrel. If high pressure water be now admitted to the inside of the cylinders the mandrel will be drawn back and the lead bush squeezed tight into the space between the tube and the mandrel.

As the motion of the mandrel continues the lead is placed under great pressure and begins to flow past the shoulder in a circular sheet, but at the same time expands the tube, as shown.

The motion of the mandrel still continuing until the shoulder on H begins to enter the tube plate, the lead is extruded between the face of the bolster and the end of the tube. The great pressure brought on the end of the tube by the lead as it flows out expands it into a bell shaped form, suitable for water tube boilers. When the mandrel has been drawn right back it can easily be taken out of the tube and the thin sheet lead that is left

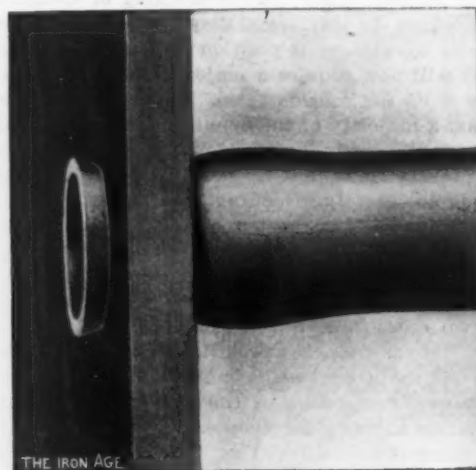


Fig. 1.—View Showing Expanded Tube.

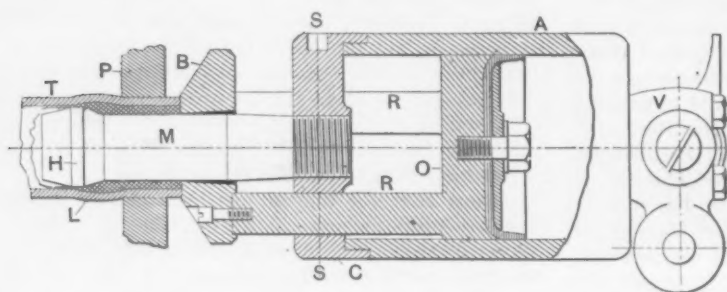


Fig. 2.—Longitudinal Section.

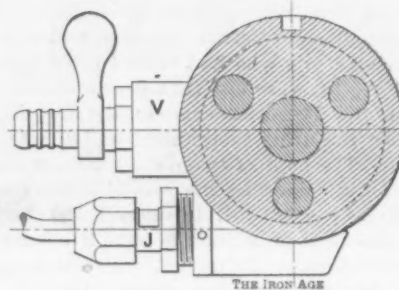


Fig. 3.—Cross Section through S S.

### PLASTIC PRESSURE TUBE EXPANDER.

is made use of in the tool to which we refer in a very ingenious way, and will be readily understood on reference to the figures. The cylinder A is of phosphor-bronze, or other suitable material, having inside it a piston, O. This piston has three rods, R, which pass through the cover C and bear against the bolster B, to which they are fixed by three countersunk screws. The piston O is fitted with a cup leather behind, the leather being fixed with a washer and set screw. At the rear end of the cylinder A is a valve, V, by which high pressure water can be admitted to the piston. The valve is controlled by the lever, shown in Figs. 2 and 3. In the center of the cover, at the front end of the cylinder, is screwed the mandrel M, the forward end of which is enlarged, as shown at H, which part makes an easy fit inside the tube to be expanded.

The operation of the tools is as follows: The piston having been drawn back to the rear end of the cylinder as far as it will go, a lead bush, L, in halves, is placed round the mandrel. The latter is then pushed inside the

scraped out. The end of the tube after the operation is completed is shown in Fig. 1.

The expansion, if desired, can be confined to the thickness of the tube plate only, without producing either a bell mouth or enlargement of the tube behind the plate. This is done with the same apparatus, by using stops, which prevent the mandrel entering too far inside the tube. The amount of expansion can be regulated by the original length of the bushing. It will be readily seen that the tool is equally well adapted for expanding tubes into flanges for steam pipes as into tube plates, and also for enlarging the ends of tubes.

Sheet lead of 5 or 6 pounds per foot is used for these bushes; it is cut into strips of a width equal to the required length, say  $1\frac{1}{2}$  to 2 inches. These strips are afterward placed in a special press, which at each stroke cuts off a blank from the lead and gives to it the proper semicylindrical form. The cost involved in the use of lead bushes is practically the difference between the cost of sheet lead and the value realizable for scrap lead. We



understand that joints expanded as described have been tested up to 3900 pounds per square inch water pressure, without showing any signs of leakage or loosening in their holes.

John I. Thornycroft & Co. have adopted the tool in their works, and, with the approval of the Admiralty, are using it on the boilers of four first-class torpedo boats which they are building for the British Government. The makers of the tool are the Newall Engineering Company, Limited, 141 Queen Victoria street, London, E. C.

### The Universal Work Holder.

The work holder here illustrated is a vise with universal adjustment designed to meet the requirements of mold makers, die sinkers, silversmiths and others



THE IRON AGE

### THE UNIVERSAL WORK HOLDER.

requiring a vise that will enable them to change their work to any position and hold it firmly for chipping or hammering. The construction of the vise is such that its position can be changed quickly without removing any part. The vise proper is carried by what is practically a universal joint upon the upper end of a standard which can be raised or lowered as required. The device is mounted upon a column provided with a table. The vise can be removed from the stand and set in a drill press and the work then adjusted and drilled at any angle. The face plate is provided with slots for the purpose of holding extra large work. The holder is made by the Wheeling Mold & Foundry Company of Wheeling, W. Va.

A movement has been inaugurated among the architects of New York State to secure legislation requiring architects to register before practicing their profession. The Architectural League of New York has appointed a committee to draw up a bill for this purpose. The aim of the league is to prevent persons not properly qualified from drawing plans for the erection of buildings.

### The New Bayonne Plant of the Babcock & Wilcox Company.

With the beginning of the new century work was begun in the new boiler works of the Babcock & Wilcox Company at Bayonne, N. J. The engine was started at midnight at the dawn of the new year in the presence of the Mayor of Bayonne and a number of the city officials and the officers and heads of departments of the Babcock & Wilcox Company. Operatives went to work at once in the drum shop, which is the first department to be put in operation, and in the presence of the guests a steam drum was completed out of the flat sheets. Those present witnessed all the operations of shearing, punching, rolling, riveting and assembling involved in its manufacture.

The new works of the Babcock & Wilcox Company are located in Bayonne, where the company have purchased 30 acres of land, having a frontage of 650 feet on the Kill von Kull, with a depth of water of 25 feet on the pier line. The plant is the largest of its kind in the world, the buildings completed having a floor area of about 160,000 square feet, to which will be added at once buildings of approximately 40,000 square feet floor area. The plant is equipped throughout with special tools, and has been designed with the greatest care to expedite the processes of manufacture by reducing to the last degree the needless handling of material and by the use of the most approved appliances.

The business of the Babcock & Wilcox Company was established over 30 years ago, beginning with the partnership existing between Babcock & Wilcox in the manufacture of engines in the early sixties. The first boilers were built by them in 1867. The partnership was to build the new works now nearing completion.

The works of the company have hitherto been located on grounds leased from the Singer Mfg. Company in Elizabethport, N. J., but the enormous growth of the business in later years made necessary an increase in productive capacity, and in 1899 the company decided to build the new works now nearing completion.

The site chosen is an ideal one. So large a tract of land with so desirable a water frontage close to New York City is exceedingly difficult to obtain, and in most instances such a manufacturing site can only be obtained by filling in soft marshes fronting on the water. The site occupied by the Babcock & Wilcox Company is remarkable in that it consists wholly of solid ground, no piling having been used for either the buildings or the heavy foundations required for the machinery installed. A spur track from the Central Railroad of New Jersey enters the property, so that the company enjoy the best of facilities for shipping, both by rail and water.

The famous water tube boilers manufactured by the Babcock & Wilcox Company have a world wide reputation. The success of the water tube boiler dates from the first boilers of their manufacture. In addition to the enormous business which they are doing in stationary boilers the company have in the last few years entered into the manufacture of marine water tube boilers, which are now extensively used in the United States Navy, are being introduced in the British Navy, and are very widely used in the merchant marine.

John Good, the famous inventor of cordage machinery, is bringing out a new baling press for producing round bales of hemp in Manila and Mexico, preparatory for shipping. The John Good & Jennings Patent Machine Cordage Company of Brooklyn are running day and night.

The contract for the building of the new Carnegie library at Duquesne, where the Duquesne Steel Works of the Carnegie Steel Company are located, has been given to Wm. Miller & Sons of Pittsburgh for \$300,000. The building was designed by Alden & Harlow, architects, of Pittsburgh. The lower story will be of stone, while brick and terra cotta will compose the upper part. The institution will have all the departments which go to make up all the other smaller Carnegie libraries. There will be a library and music hall. The other adjuncts will consist of a billiard room, gymnasium and natatorium.

### The Evans Ingot Stripper.

The ingot stripper here illustrated has been in most satisfactory use at the works of Crawshay Bros., Cyfarthfa, Wales, since October, 1898. It is designed to strip two ingots at the same time, the ingots worked being about 6 feet high. The following description is from the *Iron and Coal Trades Review* of London:

Notwithstanding the great range in the size of ingot capable of being stripped by this machine, and the consequent long strokes of the stripping rams, yet the height of the stripper is very considerably less than that of any other ingot stripper, its total height when all its rams are fully extended being only 34 feet 9 inches. This reduction of height is obtained by the use of three comparatively short rams, instead of one long one, as is the

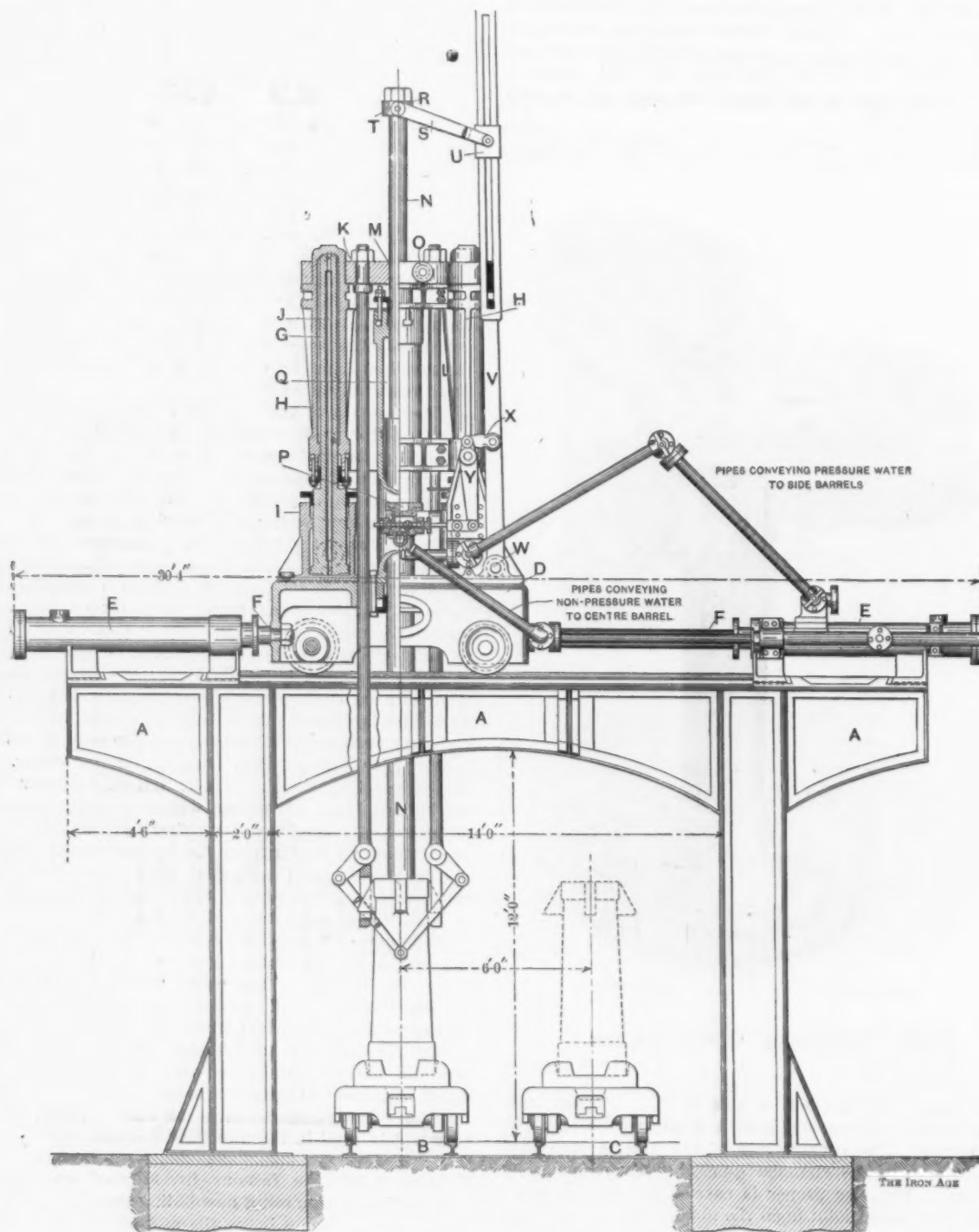


Fig. 1.—Sectional Front Elevation.

### THE EVANS INGOT STRIPPER

Both long and short pieces can be stripped with equal ease, the shortest piece upon which the stripper will exert its full thrust (equal to a force of 75 tons) being 1 foot 6 inches, thus obviating the frequent serious delays arising from the necessity of throwing gags into the molds for the purpose of stripping short pieces. It strips the most obstinate stickers without requiring any hammering of the mold while the strain is on the ingot, which frequently has to be done with other strippers.

The special features of the machine may be stated broadly as follows:

case in other strippers, and thus the long stroke of this one ram is converted into two comparatively short strokes, giving the machine a great increase in stability, &c.

Of the three stripping rams above mentioned, the two outside ones, Fig. 1, pull the mold up, while the center ram holds the ingot down. The center ram uses no pressure water, but is kept unmovable from the top of the ingot by means of non-pressure water, which flows by gravity into the barrel of the ram, and being locked therein by an automatic operating valve, prevents the

ram from rising. This non-pressure water is again liberated automatically when the stripping is complete by means of the above mentioned valve.

The consumption of pressure water is also greatly economized by differentiating the diameters of the side rams, a large diameter being used for the initial pull upon the mold and a smaller diameter for the easier work of raising the mold clear of the ingot.

The working of the machine is made exceedingly simple for the operator, since all he has to do is to take the pressure off, thus allowing the three rams to descend, the center ram stopping of itself upon the top of the ingot and the two side rams continuing to descend until the stirrups engage the lugs upon the mold, when he puts the pressure on and raises the mold and so completes the operation.

The machine consists of the following parts, viz.:

The gantry A spanning the two roads B and C, B

capable of being worked either independently or together.

Each set of stripping cylinders comprise—

*First*—Two outside differential rams G, with their top barrels H, and bottom barrels I; each of these outside rams has a hole, J, in its center, through which the pressure is conveyed from the bottom barrel of large diameter to the top barrel of small diameter. When the

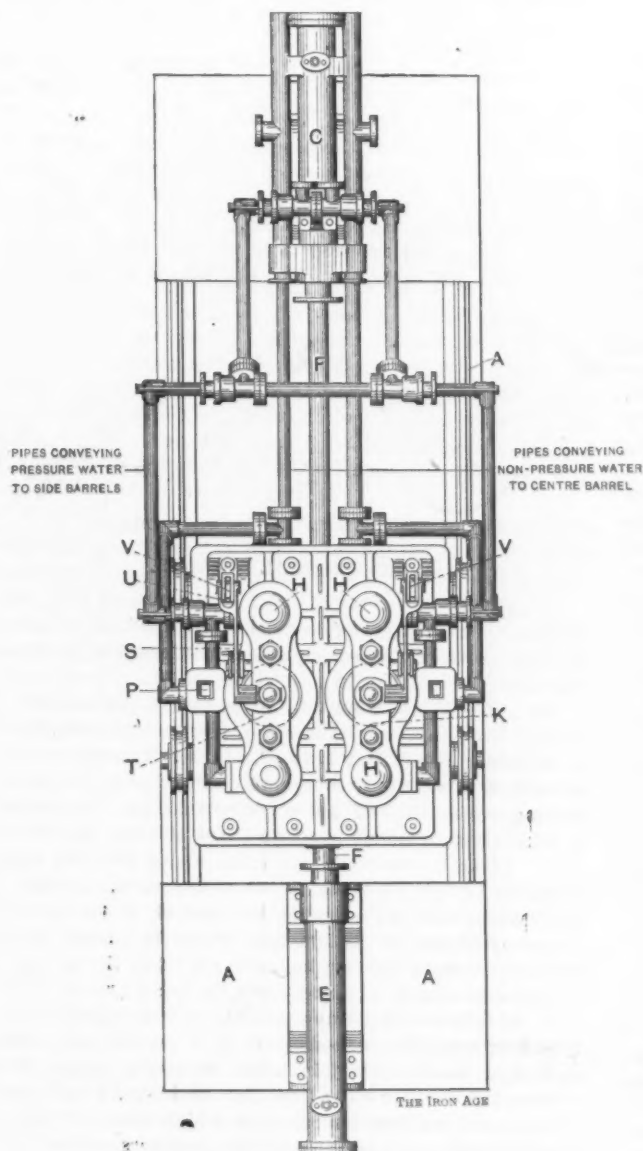


Fig. 2.—Plan.

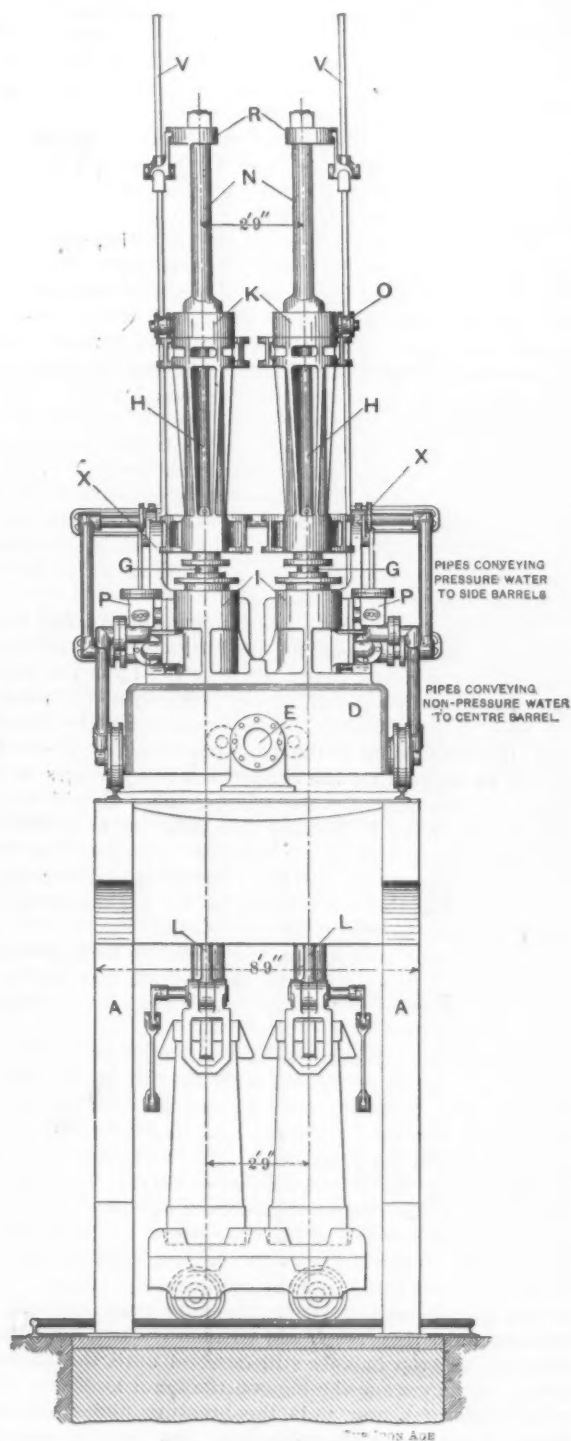


Fig. 3.—Side Elevation.

#### THE EVANS INGOT STRIPPER.

being the road upon which the bogies carrying the full molds are brought up, and C being the road upon which the bogies carrying the empty molds are returned to the casting shop. The carriage D, upon which are the two sets of stripping cylinders, is moved backward or forward along the gantry by means of the traversing cylinders E with their rams F.

The drawings represent the machine as designed to strip two ingots at one time; there are, therefore, two sets of stripping cylinders with their rams, each set

pressure is put into the bottom barrels I the two rams G, together with their top barrels, are raised through the stroke allowed by the bottom barrels; the pressure water then finds its way through the holes J in the side rams G, and acts upon the tops of these rams, raising the top barrels through the stroke allowed them.

*Second*—A strong cross head, K, which rests upon the tops of the upper barrels of the side rams, and to which are attached the slings L for engaging the lugs upon the ingot molds. In this cross head, midway between the



two side rams, is a hole, M, through which the extension of the center ram N passes; and fixed to the side of the cross head is a friction roller, O, which operates the automatic gear for opening and shutting the valve P, controlling the supply of non-pressure water to the center barrel Q.

*Third*—The center ram N, with its barrel, Q, which merely acts as a stopper, preventing the ingot from rising when the mold is being pulled up. The top end of this ram is of smaller diameter than the bottom, and is furnished with a boss, R, and it is by means of this boss that the center ram is moved, as the boss rests upon the cross head whenever the center ram is not upon an ingot. To the top of the center ram is attached the lever S, which is operated by the friction roller O, and which operates in its turn the levers for working the automatic valve controlling the supply of non-pressure water to the center barrel.

*Fourth*—The automatic gear for operating the valve controlling the supply of non-pressure water to the center barrel, consisting of the lever S, which is attached to the boss R. This lever has at T a heel, which engages a projection upon the boss, and thus its downward movement is restricted. Upon the other end of the lever is a side block, U, embracing the long lever V, which is pivoted at W. This side block moves up and down upon the lever, and by means of its weight moves the lever in toward the center ram, and so locks in the non-pressure water. This lever is connected at X to another lever, Y, which is connected direct to the stock of the valve P, and the object of this lever, Y, is merely to multiply the stroke of the lever V, so as to insure sufficient stroke for the valve P.

Assuming that there is a bogle containing a full mold under the stripper, upon the road B, and that the stripping rams are raised ready for lowering upon the ingot, and also that there is an empty bogle upon the road C for receiving the molds when stripped off the ingots; then, the rams being in the same position, the cross head K will be supporting the center ram N by means of its boss, and consequently the friction roller O will be up against the lever S, holding the latter in a horizontal position. When this is the case, the other levers—viz., V and Y—will occupy such positions as to keep the valve P open, so that there is free access for the non-pressure water into the barrel of the center ram.

The operator now takes the pressure from beneath the two side rams G, causing these rams, together with their top barrels, the cross head and the center ram, to descend together.

The whole of the above descend together until the center ram comes in contact with the top of the ingot—either a short piece or a full sized ingot—when the center ram stops, but the two side rams, together with their top barrels and the cross head, continue to descend, and in descending the friction roller O leaves the lever S, which drops into the position shown on the drawing by means of the weight of the side block U. This movement of the lever S draws in the long lever V and so shuts the valve P, so that the non-pressure water is now locked in the center barrel. The side rams continue to descend until they reach the bottom of their lower barrels, but the top barrels still descend until the stirrups on the slings engage the lugs on the ingot molds.

The operator now puts the pressure under the side rams, which, together with their top barrels and the cross head K, rise, and so strip the mold off the ingot, as the center ram is unable to rise owing to the non-pressure water being locked in its barrel. The side rams, with their top barrels, together with the cross head, continue to rise until the friction roller again comes in contact with the lever S, and raising it again into a horizontal position, pushes out the long lever V and so unlocks the water from the center cylinder by opening the valve P. The center ram N is now able, by means of its boss, to be raised by the cross head K, and thus the cross head and center ram now rise together; the cross head, by means of the slings, carrying the molds which have been stripped.

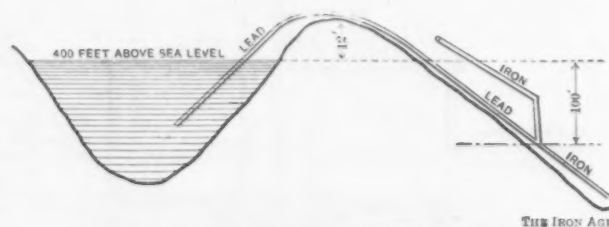
The pressure being still under the side rams, the operator now moves the carriage D above the road C by means of the traversing cylinders E, carrying with it

the stripping cylinders and also the molds. When the empty molds are above the bogle which is ready to receive them the operator takes the pressure from under the side rams, allowing the molds to be lowered onto the above mentioned bogle; the stirrups on the slings automatically disengaging themselves from the lugs on the ingot molds by means of a simple arrangement of a chain and weights not shown on the drawings. The operator now moves the carriage D, carrying the stripping cylinders, back above the road B, in readiness for the next ingots brought up, thus completing the operation.

### A Successful Siphon.

A successful solution of a siphon problem by the doing away with all trouble arising from the accumulation of air in the bend is described in a paper by Robert S. Hale before the Boston Society of Civil Engineers and printed in the *Journal* of the Association of Engineering Societies. The difficulty arose in connection with a small water supply plant.

The problem has been solved satisfactorily by the use of an air-tight siphon at a cost of about \$250, as against a cost of several thousand dollars which would have been incurred if the pipe had been laid to grade, or as against less efficient service together with an annual cost of nearly \$100 if an air chamber had been provided and kept free of air by a pump. While the solution is simple, it was not referred to in the text books or reference books which I consulted, nor was it thought prac-



A SUCCESSFUL SIPHON.

ticable by a number of engineers with whom I talked the matter over. A description may therefore prove of interest.

The Bee Hive Mountain Aqueduct Company are a private company supplying seven houses and four barns at Schooner Head, Bar Harbor, Maine. The works supply also a private golf course and a number of lawns, requiring a good deal of water for sprinkling. The supply is taken from a small pond at about 400 feet above sea level. Close to the pond is a ridge about 200 feet wide, rising to 12 feet above the level of the pond, through or over which the water must be carried to the houses. These are from 20 to 100 feet above sea level, or an average of about 350 feet below the level of the pond.

The houses are inhabited only during warm weather, and this fact obviated any necessity of burying the pipes. The first installation consisted of a 2-inch galvanized iron pipe, with screw joints, laid over the ridge. This siphoned the water over the ridge and would work satisfactorily for a few hours, after which time the siphon would break. Two or three of the plumbers at Bar Harbor, including the one who laid the first pipe, took turns in taking contracts to keep the siphon in operation for the season, but the only successful method was to open a waste pipe about 200 feet below the level of the ridge. This waste pipe gave a continuous flow through the siphon, and the result was satisfactory so far as the supply of water at Schooner Head was concerned. The method, however, involved an excessive waste of water, which lowered the level of the pond to an undesirable amount and reduced the available pressure at the houses.

Among the other means which were tried to keep the siphon in operation were:

1. The use of foot valves at the pond.
2. The use of a vent on the delivery side, in order to prevent air backing up to the top of the siphon.
3. Taping the joints of the pipe with electric tape.

This kept the siphon in operation 11 days, when the supply failed. The joints were retaped and the siphon restarted, after which it held three days, and then failed again. After that, taping the joints seemed to have no effect.

4. Tarring the joints. This could not be well done, as the pipe could not easily be heated before applying the tar.

After the plumbing contractors of Bar Harbor had tried for several years to keep the siphon in operation without the waste of water due to the drip, the matter was referred to a committee consisting of G. T. Francis, R. W. Hale, and myself. W. L. Pierce, a contractor of Bar Harbor, was anxious to try a lead pipe for the siphon, while some of the directors of the company desired to cut through the ridge. On obtaining estimates of cost, it appeared that it would cost about \$6000 to cut through the ridge (which was all rock), and about \$250 to lay a 1-inch lead pipe. It also appeared, from the study of the means previously tried for keeping the siphon in operation, that the failures were due to indraft of air through the joints of the iron pipe, which would not occur if lead pipe with wiped joints were used. That the trouble was due to air leaks at the joints was indicated also by the fact that the joints all leaked when put under water pressure.

The committee, therefore, reported in favor of a lead pipe, and this was put in last spring, water being turned into it on April 9. The siphon has held continuously from that day to October 17, the date of writing, without breaking and without waste. The result is a complete success, and the level of the pond is hardly appreciably lowered by the use of the water, instead of being lowered several feet as in former years (on account of the waste pipe). The pressure at the houses is higher than ever before, since the loss of head due to replacing 500 feet of 2-inch iron pipe with 1-inch lead pipe is less than was the loss of head due to the waste pipe formerly kept open.

The present arrangement of the pipes is as shown in the sketch. A portion of the old 2-inch iron pipe, some 200 feet long, serves as a vent to get rid of any air carried over from the pond, as shown in the drawing.

A rough estimate of the delivery of the siphon was made by placing the end of the lead pipe horizontal (by spirit level) and measuring the fall of the jet below this level in a given distance.

The computations showed a friction coefficient of 0.032 where Merriman's tables give 0.029. This agreement is closer than can be expected for such rough measurements, and it is safe to say that the pipe delivers nearly the same quantity that it would if there were no siphon.

When the lead pipe was delivering from its lower end into the air it was noticed that every few seconds a bubble of air came over from the pond. This may have been due to an air leak at some point, or to air that was given off from the water at the top of the siphon at less than atmospheric pressure, and that had not had time to redissolve. The latter is the more probable cause, since a leak would cause the siphon to break, which it has not done since it was started under the new conditions.

When considering the general question of a siphon, a short study of authorities showed me only two references. Merriman (page 192) merely says that a pump must be placed at the highest point. Kent (M. E. Handbook, page 582) describes two siphons, neither of which worked unless air was removed. When running, one gave about 25 per cent. less than the theoretical and the other gave the same as the theoretical discharge for that size of pipe. The 25 per cent. deficiency in the first case may have been due to an unnoticed accumulation of air at some point. No reference was found to any siphon that worked without removing the air, or to any attempt to make a siphon air tight.

It should be noted that the Bee Hive Mountain pipe is a very small one, and that the velocity is high enough to carry small bubbles of air over the ridge and down to the vent pipe. For a large size of pipe the velocity necessary to carry air bubbles over the ridge must be higher

than for a small pipe, and for a very large pipe an air chamber might be necessary even for an air tight pipe.

#### Conclusions.

1. The past and present experience of the Bee Hive Mountain Aqueduct Company indicates that the former breaking of their siphon was due to indraft of air at the joints. It is probable that this is the case with most siphons that give trouble.

2. The use of an air tight pipe (such as a lead pipe with wiped joints) will, for small pipes at least, make a siphon deliver permanently without the use of air pumps or chambers.

3. The use of a vent pipe on the delivery side, as at the Bee Hive Mountain Aqueduct Company, which frees the pipe from air instead of letting the air back up into the siphon, is probably an advantage.

4. While lead pipe is expensive, yet there are probably a number of cases, besides the one described, in which the use of a siphon made of air tight pipe will be cheaper than either laying the pipe below the hydraulic gradient or using an air chamber and pump.

#### British-Westinghouse Electric Company.

The British-Westinghouse Electric Company of Manchester, England, have sent out invitations for bids for over \$500,000 worth of machine tools for the new works. Henry F. Loud, general manager of the British-Westinghouse Electric Company, was in Pittsburgh last week and has already awarded contracts for the engines to the Westinghouse Machine Company of Pittsburgh and the lumber for the new building to D. L. Gillespie & Co. of that city. It is probable that nearly all the tools needed by the concern will be furnished by the United States, although the limited time will require the distribution of the contracts among a number of concerns. The British-Westinghouse Electric Company were formed about two years ago by the Westinghouse Electric & Mfg. Company, George Westinghouse and prominent English investors, to provide ample facilities for the manufacture of electrical machinery to meet Great Britain's demand. The plant will be located on the Bridgewater Canal, in Manchester, and the buildings will cover about 26 acres. The capacity will be about 80 per cent. of the present East Pittsburgh plant. About 700 men are now at work on the big buildings, and about 6 miles of track have been laid through the company's property. A good start has been made on the buildings, which will contain about 14,000 tons of steel and which are being erected by Dorman, Long & Co. of Middlesbrough, England. The main building is 90 feet long and 427 feet wide, divided in five bays. In addition steel casting, brass and malleable iron foundries are being erected, the intention of the company being to manufacture the same product as the Westinghouse Machine & Electric companies do at East Pittsburgh, except steam turbines. The plant will employ about 3000 men at the start, and when running full will give employment to 5000.

**The Berlin Construction Company.**—Among the recent incorporations in the State of New Jersey are the Berlin Construction Company, with a capital of \$100,000. The company are formed to design and erect all classes of steel buildings, bridges and structural work, and will also make a specialty of steel concrete construction in its various branches. Offices have been opened at 220 Broadway (St. Paul Building), New York, and at Berlin, Conn. The active management is as follows: D. E. Bradley, president; Geo. H. Sage, vice-president, and Seymour N. Robinson, treasurer. These gentlemen were all identified many years with the management, as directors, of the Berlin Iron Bridge Company, and recently resigned responsible positions with the American Bridge Company in order to organize the independent corporation.

A new use has been found for the Roentgen rays, in the detection of smuggling. A radiograph recently taken of a suspected package entering a South American port showed the contents to consist of watches, although the package was otherwise invoiced.



## The Granite City Plant of the National Enameling & Stamping Company.

(With Supplement.)

The Granite City Steel Works Department of the National Enameling & Stamping Company is located at Granite City, Ill., five miles north of St. Louis, on the east side of the Mississippi River. The census of 1900, the first in which the town shared, credits it with a population of 3122. Owing to the very favorable railroad facilities to and from St. Louis and the present limited supply of dwellings the official count does not do full justice to Granite City as an industrial point. Coupled with these circumstances is the fact that the census enumerators covered Granite City about a month before the new sheet mills were put in operation. The present population is approximately 5000. The number of employees on the pay rolls alone of the various industries at the present time is:

Granite City Steel Works Department .....	1,300
St. Louis Stamping Company Department (of the National Enameling & Stamping Company) .....	1,150
American Steel Foundry Company .....	1,400
Merchants' Wire & Nail Company .....	300
Markle Lead Works .....	40
Drummond Box Factory .....	75
Total .....	4,215

There is paid out monthly by these concerns approximately \$222,000.

The property of the Granite City Steel Works is 44 acres in extent. Of this there is occupied 30 acres.

### Scrap and Material Yard.

The south end of the property, conveniently served with both broad and narrow gauge tracks, is assigned to the storage of raw material and the assorting of miscellaneous scrap. A general view is shown in Fig. 1. Two Fairbanks scales of 100,000 and 150,000 pounds capacity respectively are placed on the standard gauge tracks at the entrance to yard. One standard and two narrow gauge locomotives are employed in the yard service. Heavy cast scrap is switched to a track commanded by a skull cracker or drop crane and unloaded at that point. The crane has a 50-foot mast and 40-foot jib. The drop is pear shaped, of cast steel. A 12-inch alligator shear geared to a 20 horse-power motor is mounted on a broad gauge low body car and straddles a third rail forming the narrow gauge system. This shear operates in the miscellaneous light scrap yard, the cut lengths being directly loaded into Wellman-Seaver charging boxes, the buggies each holding three boxes. An 18-inch Frank-Kneeland stationary alligator shear, driven by a 60 horse-power motor, cuts heavy material, such as axles, rails and bars. Mill scrap is no longer bundled, but placed loosely in furnace charging boxes, one of which is kept at each shear. The charging floor of the new open hearth department is 12 feet above the general level. To reach it the Wellman-Seaver Engineering Company designed an incline and conveyor having a rise of 12 in 48 feet by which means the charging buggies or cars are elevated after the car has been weighed. The conveyor is electrically driven by a 35 horse-power motor, the weighman, without additional help, operating the starting box. A spur of the narrow gauge system has been extended into the melting house on the yard level so that, when necessary, the charging buggies may, by direct lift, be hoisted through hatchway to furnace floor by the 10-ton Morgan electric traveling crane.

### The Open Hearth Department.

The new melting house is 102 x 280 feet and contains four 25-ton Siemens basic open hearth furnaces. The old melting house is 80 x 190 feet, and has two 25-ton Siemens acid open hearth furnaces. The furnace doors are operated by hydraulic lifts. A Wellman-Seaver charging machine is in service on the new furnace floor. The bridge motor on this machine served during 1155 heats without in the meantime having its commutator trued up. As in practice the motor is plugged, or current abruptly reversed, innumerable times the record is considered as unusual. The machine has three 30 horse-

power and one 2 horse-power motors, all Westinghouse.

The management has instituted a departure in the use of dolomite. Heretofore the process of calcining has been observed. The dolomite is now crushed to pea size and charged in its raw state. The crusher and bins are reached at the yard level, a rock bucket elevator carrying the crushed dolomite to a platform and runway, extended from midway of the melting floor.

The casting floor of the new melting house has two rectangular casting pits 14 x 63 feet 4 inches in the clear. Two individual ladle repair pits are located between and in line with the casting pits. Facilities are provided for heating four ladles, on separate stools. Each melting house has a 40-ton Shaw electric traveling crane for handling the ladles; two 10-ton Morgan cranes are used for the molds and ingots in the new house. One 10-ton Shaw traveling crane serves the charging floor of the old house. The molds are of regular plate mill pattern, the casting being done from the top. There is in use a pneumatic ingot stripper designed by the company's engineer, on which a pressure of 600 pounds is carried. The cylinder is 14 inches in diameter. The piston rod is 6 inches in diameter and has a 36-inch stroke. The rod is turned down at the end to receive the 7-inch diameter steel pressure thimble having concave end. In practice the stripper is suspended vertically from the 10-ton pit cranes, stirrups on the stripper engaging lugs on ingot molds, and operated by the pitman. The ingot buggies have four compartments and are cast steel throughout, including bolsters. The design is new and results in a material decrease in weight, the average being 5700 pounds.

### The Universal Mill.

There is a practically straight run of 360 feet parallel to the melting house, from the center of the casting floor to the soaking pits. There are two 4-hole pits flanking the feed roll train of the universal mill, the ingots being handled by a 5-ton Shaw traveling crane. The covers of the pits are operated hydraulically. The universal mill rolls are 26 inches in diameter, the travel of the vertical rolls being designed for 8-inch to 36-inch plates. The horizontal roll screws are operated by a 30 horse-power Westinghouse motor. The top roll is balanced by hydraulic jacks. The mill is operated by a pair of reversible link 30 x 48 inch engines. The reversing mechanism is operated by steam against hydraulic pressure; the hydraulic pressure raising the links, the drop being against steam as a cushion. The two sets of feed rolls are each driven by a pair of 10 x 12 inch reversible link engines, as is also the feed train of the 42-inch hydraulic shear. After passing through the hydraulic shear the plate is delivered to a stand of drag rolls geared to a 3½ horse-power motor, which deposits it on the straightening bed. Upon cooling the plate is lifted clear of the bed by elevating, through rocker shaft, the free ends of transfer table runways or channels, Fig. 2, and the 30 horse-power motor of the link conveyor set in action. The pins connecting the links have their ends extended and journaled thereon are wheels whose diameter exceeds by 1 inch the width of the links. These wheels travel in channels, and as the plate touches their periphery it is given a travel in excess of the conveyor proper. In order that the shearing of plates into sheet bars be continued without interruption there is a set of feed rolls, driven by 20 horse-power motors, for each of the 42-inch shears. One of the shears is steam driven, the other by a 70 horse-power motor, as shown in Fig. 3. From the shears the bars are conveyed to the sheet mill, or if for shipment to one of the other plants of the National Enameling & Stamping Company the bars are piled into an open end metal box. This box is weighed, and on being taken to a gondola car by a 5-ton Pawling & Harnischfeger electric hoist and traveler on an overhead trolley beam is cleared of its load through its open end.

There are 13 12-ton Duff water seal gas producers located in the gas house No. 1. Of these, six, 12 x 14 feet, serve furnaces Nos. 1 and 2 and the two 4-hole soaking pits. Furnaces Nos. 3, 4, 5 and 6 are supplied by seven 12-foot producers. Porter valves are used throughout for gas and air in the open hearth furnaces.



**The Sheet Mill.**

The main sheet mill building is 120 x 644 feet. The mills, four on each side, are direct connected with the

being 21½-inch face by 20¼ inches deep or thick. The crank shaft bearings are 24 x 48 inches. The weight of the shaft and overhanging cranks is 54 tons. Each pair

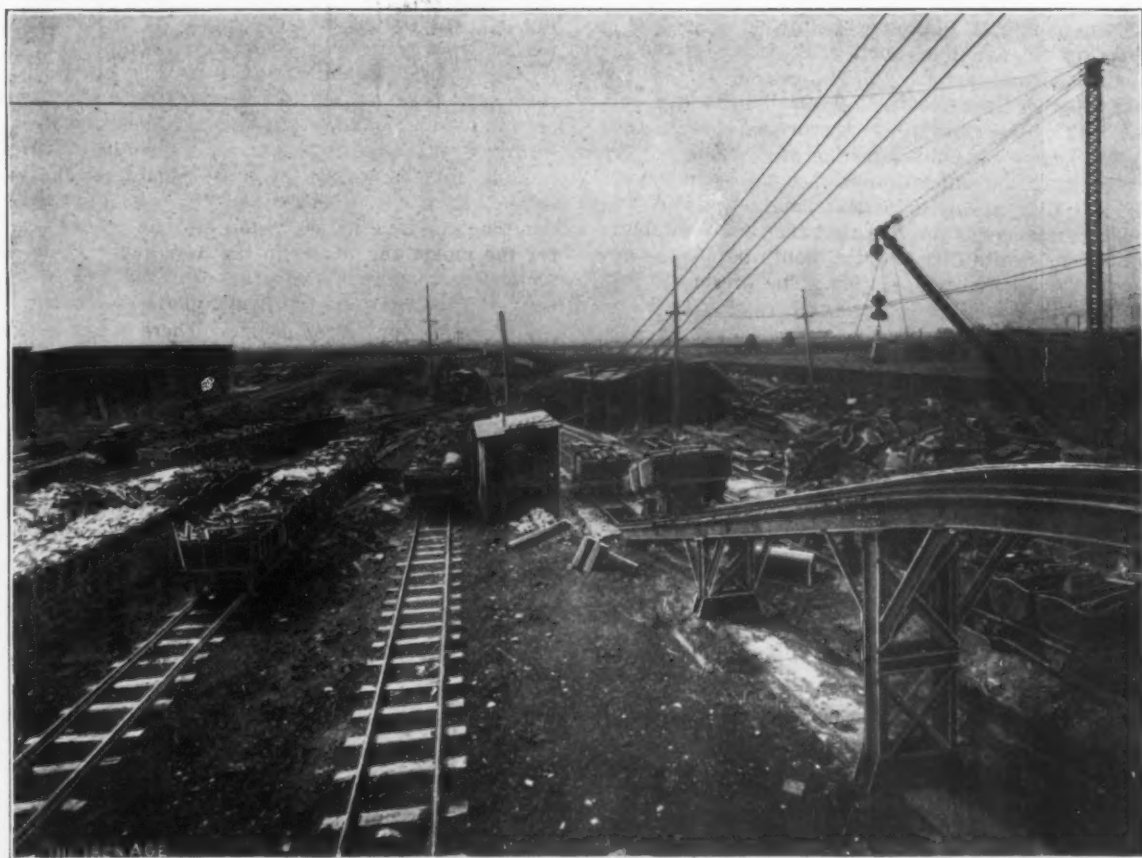


Fig. 1.—The Scrap and Material Yard.—Portable and Stationary Shears and Drop

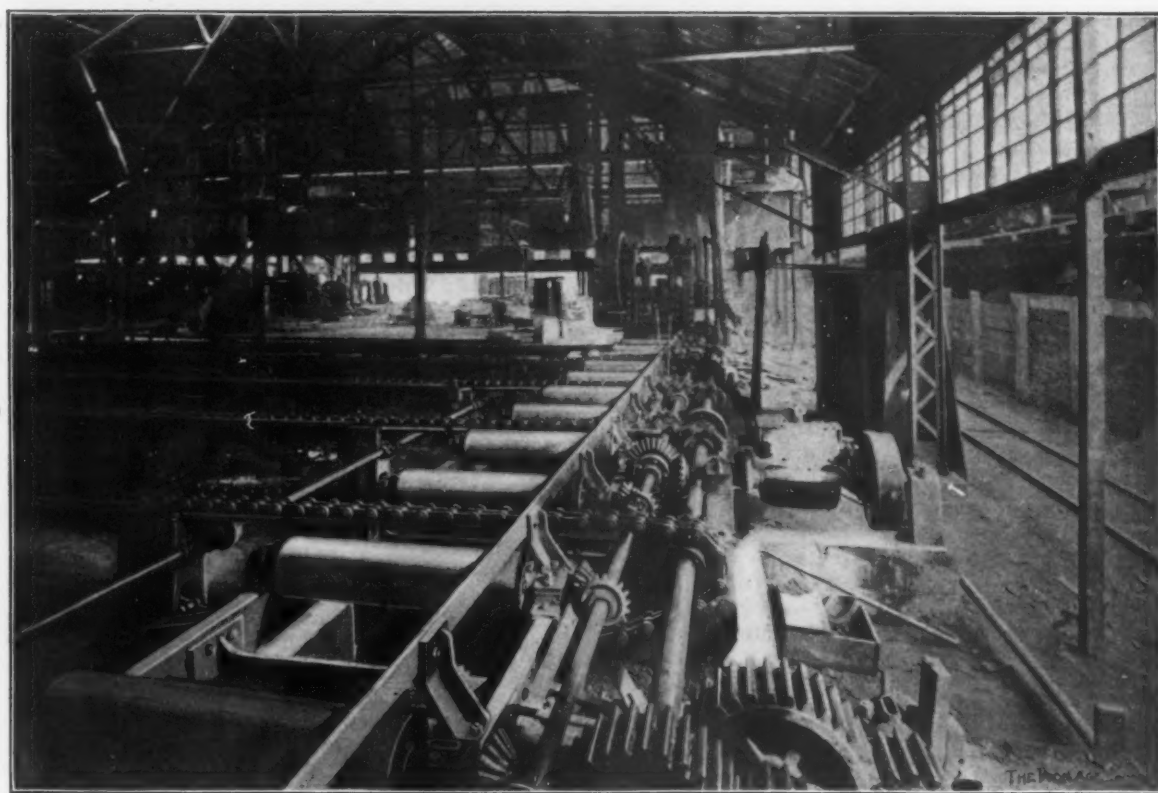


Fig. 2.—Plate Transfer Table, 42-Inch Steam Shears and Transfer Link Conveyors.

**THE GRANITE CITY STEEL WORKS AND SHEET MILLS.**

Kennedy overhanging crank to 30 and 56 x 60 inch Cooper Corliss twin tandem compound condensing engines. This is said to be the first instance in which sheet mills are direct connected. The fly wheel for each pair weighs 100 tons, is 30 feet in diameter, the rim

of engines, at 115 pounds boiler pressure, develops 2000 horse-power at 27 revolutions per minute.

There are 16 mills in this building, a view of some of them being shown in Fig. 4. The roll barrels are 26 inches in diameter, the mills ranging from 30 to 40 inch.

Five Frank-Kneeland roll turning lathes, each motor driven, are conveniently placed in the center of the building. Each mill is provided with a sheet and pair recuperating gas heating furnace, the gas being furnished

squaring shears. As mentioned before, a melting furnace charging box is kept at each shear into which the mill scrap is loosely thrown and afterward delivered to the furnace without bundling. The squared sheets,

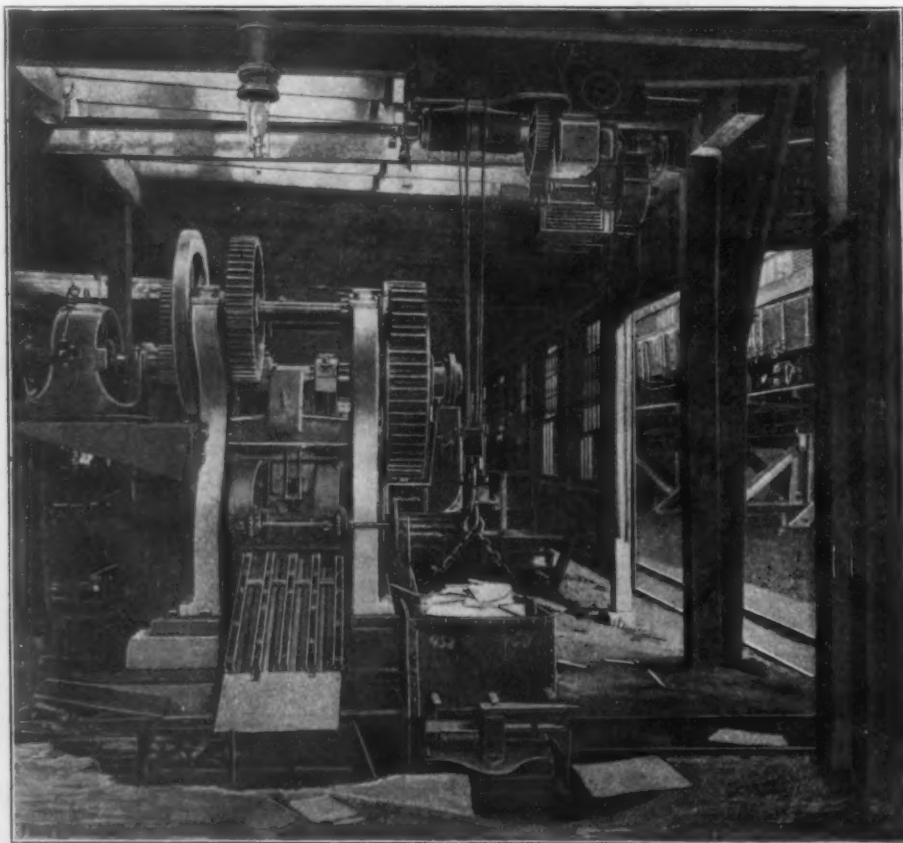


Fig. 3.—42-Inch Electrically Driven Shear and 5-Ton Electric Hoist and Traveler.



Fig. 4.—Bird's Eye View of New Sheet Mills. (Taken from Craneman's Cage.)

#### THE GRANITE CITY STEEL WORKS AND SHEET MILLS.

by six 12-foot Duff's producers. There is a doubling shear, with independent 5 horse-power motor, and a squaring shear for each mill. A 20 horse-power motor belted to a main shaft drives each complement of eight

after splitting, are placed on Howe standard platform trucks.

#### The Pickling House.

The trucks are taken by a transfer car, operating

along the depressed narrow gauge track of the mill building, to the pickling house, being weighed *en route* on a 41,000-pound Fairbank truck scale. The pickling

uring tanks in the two pickling houses. There is a passageway to the annealing house from each pickling machine, so that the operations may continue uninter-

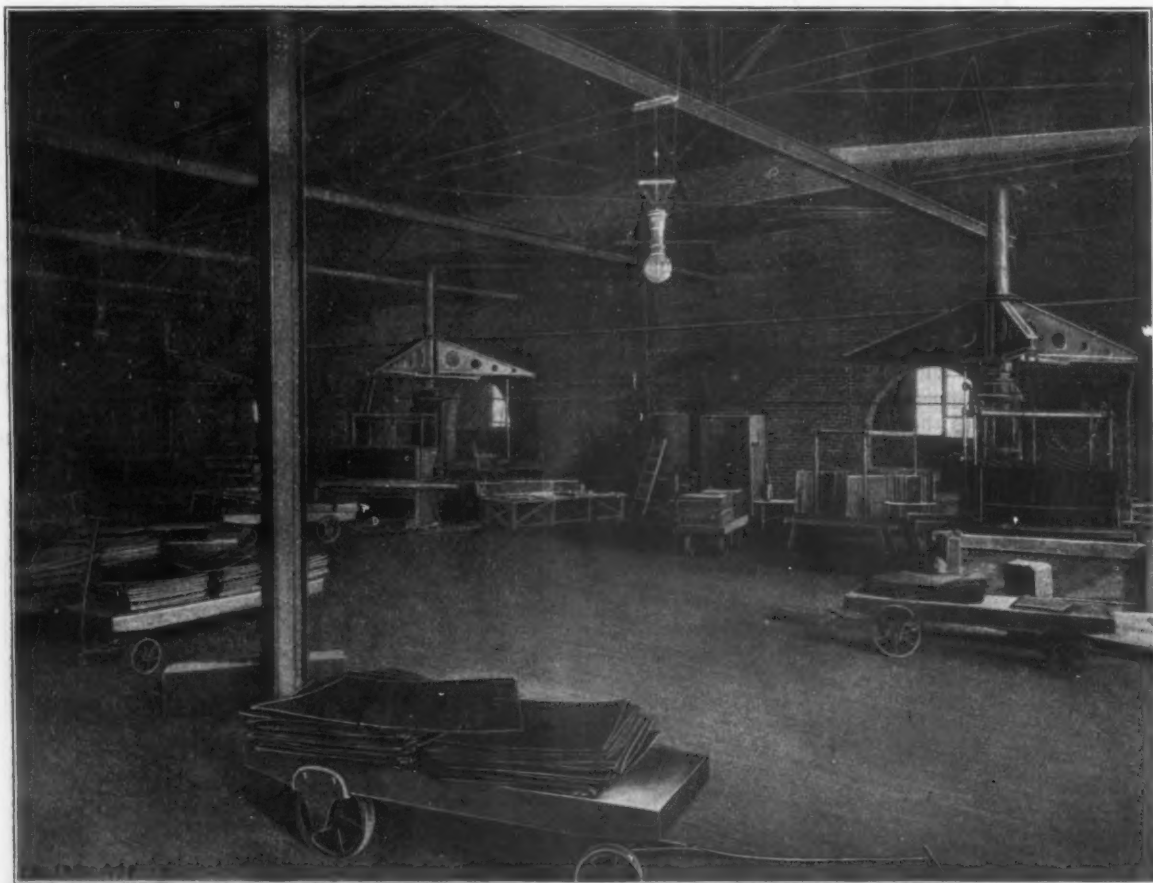


Fig. 5.—Pickling Room



Fig. 6.—View of Cold Mills and Annealing Furnaces from Shipping End.

#### THE GRANITE CITY STEEL WORKS AND SHEET MILLS.

house is 78 x 126 feet and is equipped with three Mesta machines, shown in Fig. 5. The acid as received in tank cars is discharged by compressed air into an elevated receiver, from whence it has gravity flow to meas-

uredly. These three machines clean the output of the 16 hot mills in the main building. There is a fourth Mesta machine housed at the cold mill end of the annealing house. This machine handles the output of the



six new hot mills which have been erected in what was the original plate and bar mill building.

#### The Annealing House.

The annealing house, Fig. 7, is 95 x 346 feet, has brick walls, the girders for the two 20-ton traveling cranes being carried on steel columns. The annealing furnaces, 17 feet deep by 18 feet long, 6 feet high inside, are ten in number. Five 10-foot Duff's gas producers are in their service. Each furnace holds 8 boxes, the capacity of each furnace being about 50 tons. The boxes are entered into furnaces and withdrawn by a Freeman charging machine, the chains being operated by a separate motor on the traveling cranes. The machine is in two parts. The lower part carries the crown face track wheels and has extended sides to receive the housing for one end of a hydraulic jack. It has a set of elevated flat face roller wheels on journals extending between its sides. The upper part of the machine, on which the boxes rest, carries the other end of the jack and is raised or lowered by a series of wedge pieces brought

ground and the fact that the original plant presented no obstructions.

#### The Power Plant.

It is noteworthy to state that electricity has been employed throughout the plant to an unusual extent. The generator sets are two in number, comprising a St. Louis Corliss double eccentric heavy duty 18 x 36 inch engine, direct connected to a Siemens-Halske 10-pole, 200-kw., 220-volt generator. The same generators supply the current for lighting buildings and yards. Three Crocker-Wheeler 100-kw. generators are kept in reserve.

The steam plant for the electric engines and the universal mill engines consists of 12 Wangler tubular 60-inch by 18-foot 90 horse-power boilers. A Deane 12 x 7 x 10 inch duplex pump is used for feed water, a Hall 8 x 6 x 16 inch duplex being kept in reserve. The hydraulic plant consists of two Hall 24 x 8 x 24 duplex pumps. The accumulator is 12 feet in diameter by 10 feet high. A pressure of 450 pounds is maintained, the boiler pressure being 100 pounds.

The boiler equipment for the engines of the new mills



Fig. 7.—Annealing House from Pickling House End.

### THE GRANITE CITY STEEL WORKS AND SHEET MILLS.

to radius at the end, which bear on the elevated or secondary wheels of the bottom part. After the annealing operation the boxes are taken bodily by the traveling cranes to the shipping room or to the cold rolls. The steel plate welded box cover is removed, the cast base remaining under the sheets at the department where delivered until all sheets have been disposed of. There is a sufficient quantity of spare bases to prevent unnecessary rehandling of material.

#### Cold Mills and Shipping Department.

Convenient to the annealing furnaces are placed 10 cold mills 22 inches in diameter, barrels varying in length from 36 inches to 40 inches. The mills are tandem gear driven by a Cooper Corliss noncondensing engine. After leaving the cold rolls the sheets are retaken to annealing furnace and then to the 135 x 168 feet shipping department for forwarding to the various stamping works of the National Enameling & Stamping Company. Fig. 6 shows a general view of these departments.

From the material yard to the shipping department there is no occasion for rehandling the product. The drawings clearly show that care has been taken to avoid waste of time and money in the various operations. In this the engineers have been aided by an abundance of

is made up of four Cahall, 175 horse-power each, upright, and eight Heine, 275 horse-power each, water tube boilers. All are equipped with Playford stokers, the ashes being removed by a Jeffrey conveyor system. There are two Worthington 14 x 8½ x 10 inch feed pumps, and one Cochrane 3000 horse-power feed water heater and purifier. The exhaust steam from the two engines driving the six-mill plant is conducted through the Cochrane heater. There is a Cochrane steam separator at each engine.

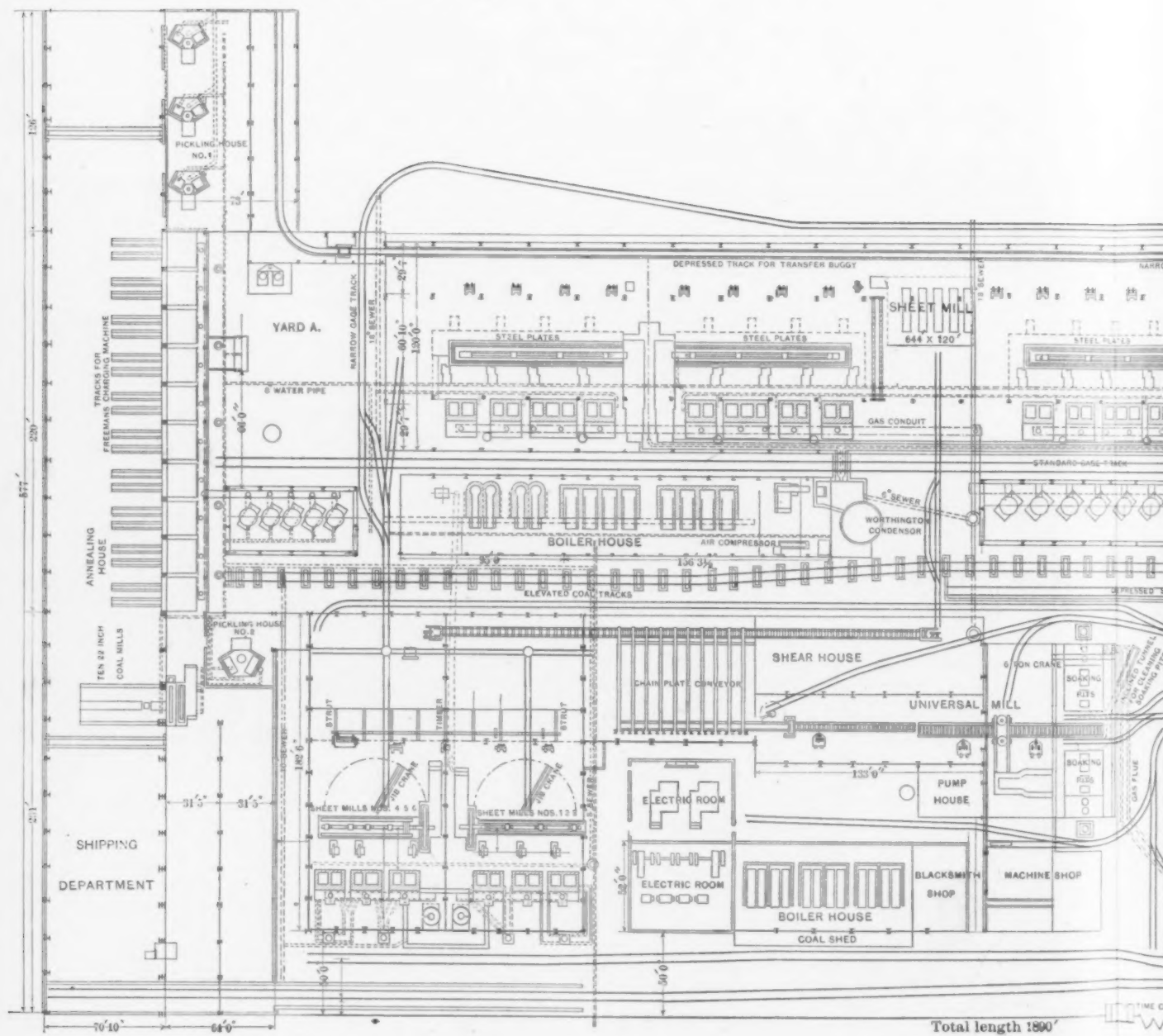
Excepting that made by the 12 hand fired old style tubular boilers located in the original steam plant, there is a marked absence of smoke during the most active operation of plant.

#### The Condenser Plant.

The condenser plant for the new mill engines consists of one Worthington cylindrical steel cooling tower 22 feet diameter by 31 feet high, and one central jet condenser, receiving the exhaust steam from the engines of the new sheet mills. The main exhaust header is 24 inches in diameter. One hot water centrifugal pump delivers water from the hot well to the cooling tower; one cold water centrifugal pump delivers water from the cooling tower to the condenser; a rotary dry-

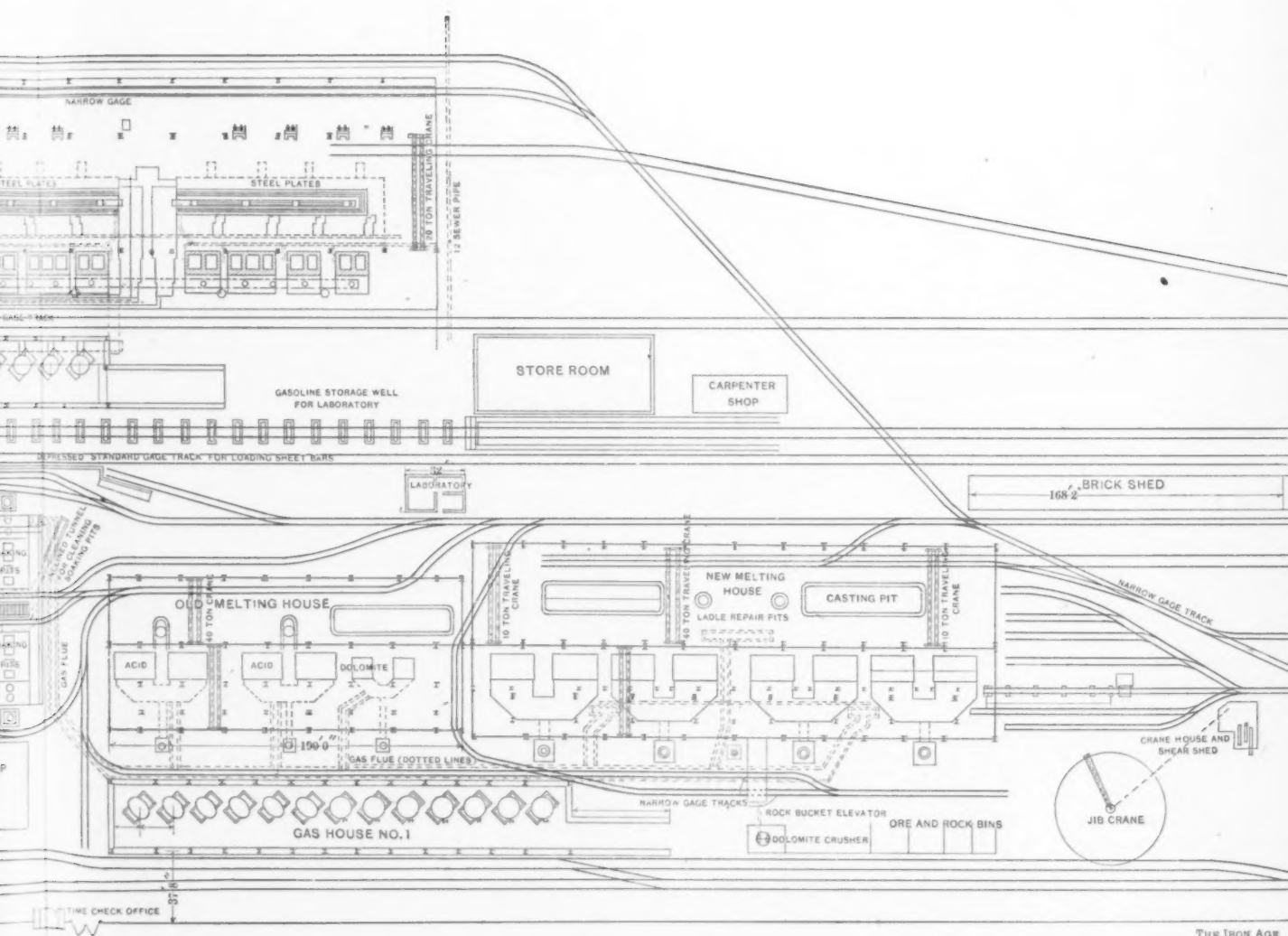


SUPPLEMENT TO THE IRON AGE, JANUARY 10, 1901.



THE GRANITE CITY STEEL WORKS AND SHEET MILL OF T  
AT GRANITE





THE IRON AGE

L OF THE NATIONAL ENAMELING AND STAMPING COMPANY,  
ANITE CITY, ILL.



vacuum pump, the steam and vacuum cylinders arranged in tandem on the same rod, completes the equipment. The hot and cold water centrifugals are on the same shaft, and are driven by belt from the balance wheel of the vacuum pump. The entire work of pumping the hot and cold water and air of a self cooling condenser plant is thus accomplished by the use of one steam cylinder. The method of operating the system is as follows: After producing condensation in the condenser and falling to the hot well, the heated water is taken by the hot water circulating pump and delivered to the cooling tower, falling through the cooling tower and being cooled. The water in the suction tank is taken by the cold water circulating pump, assisted by the vacuum in the condenser, and is discharged into the latter, to again produce condensation, thus completing the cycle.

The Frank-Kneeland Machine Company, Pittsburgh, were the designers and contractors for the new plant, and makers of the complete mills and shears. The annealing furnaces were built by Miller Bros., Pittsburgh, and the buildings by the Shiffler Bridge Company, Pittsburgh, now a department of the American Bridge Company. The plant was designed for turning out a special product of open hearth steel suitable for enameling purposes, and especially for the making of the well-known granite ware made at this company's factories under their patents.

## The Interstate Commerce Commission.

### The Fourteenth Annual Report.

WASHINGTON, D. C., January 8, 1901.—The fourteenth annual report of the Interstate Commerce Commission was transmitted to the House and Senate on the 4th inst. It contains, in addition to the brief synopsis given to the daily press, some interesting features of special importance to the readers of *The Iron Age*, including a general discussion of the recently developed tendency of railway combinations, advances in freight rates by changes in classification, and a summary of the commission's work in its efforts to compel the adoption of safety appliances. Under the last mentioned head will be found suggestions of value to manufacturers, inventors and others concerning the character of appliances best adapted to securing much desired results.

The commission repeats the recommendations recently made concerning the necessity of additional legislation to enable it to enforce its decrees and to restrain in some degree competitive action tending to disastrous results.

"The idea of public regulation," says the report, "implies certain standards of correct conduct to which all carriers shall conform. It also implies some measure of supervision and control over those subject to its requirements, to the end that these standards may be observed and practices made to conform thereto. This, without doubt, is inconsistent to some degree at least with actual and constant competition, as that term is commonly understood."

#### Railway Combinations.

Referring to combinations of railway lines, the report says that one of the striking features of recent times in the industrial world has been the tendency to combine for the purpose of limiting or eliminating competition. In no branch of industry probably is the inducement to form combinations of this sort greater or the advantages to be hoped for from them when formed more certain than in railway operations. Continuing, the report says:

"While the commission has no actual knowledge of the extent of recent railway combinations, it has informed itself as well as possible from unofficial sources. Disregarding mere rumors, but taking account of well authenticated statements, there were absorbed in various ways between July 1, 1899, and November 1, 1900, 25,311 miles of railroad. There are in the whole United States something less than 200,000 miles of railroad, and more than one-eighth of this entire mileage was, within

the above period, brought, in one way or another, under the control of other lines. The scope and effect of these operations is illustrated by some examples given in the report." The commission goes on to say that "when we consider what has actually been done, what is undoubtedly in contemplation, the entire feasibility of these schemes, the very great advantage which would result to the owners of the properties involved, and the fact that a step once taken in that direction is seldom retraced, it becomes evident that in the immediate future the main transportation lines of this country will be thrown into great groups, controlling their own territory and not subject, with respect to most of their traffic, to serious competition.

"Such a condition is not without its benefits. The evils which competition begets will largely disappear with that competition and many of the worst forms of discrimination will cease. Owing to wasteful competition transportation by rail actually costs more than it ought. To eliminate that competition will be to work an actual saving in the cost of the service, and this should redound to the benefit of both the carrier and the shipper.

"The danger lies in the fact that the only check upon the rate is thereby removed. Hitherto competition between carriers has kept down the price of carriage. If that is taken away nothing remains except the force of popular opinion and the feeble restraints of the present law, which are of little effect when directed against slight and gradual advances. It will lie within the power of two or three men, or at least a small group of men, to say what tax shall be imposed upon the vast traffic moving between the East and West. The nature of the service and the conditions under which this species of property is operated may be such that it cannot be, and perhaps ought not to be, brought under the controlling force of competition, but those very conditions make it imperatively necessary that some other control should be substituted for competition."

#### Classification.

Concerning the advances in freight rates brought about by changes in the classification which took effect January 1, 1900, the commission asserts that the declaration of the railroads that the changes were necessary because the cost of operation had been enhanced and net revenues thereby decreased was without foundation. Continuing, the report says:

"Comparisons for three large Eastern systems show that the percentage of operating expenses to earnings was less in the year ending June 30, 1900, than for the corresponding year 1899 or for the average from 1890 to 1898. Another comparison of these statements shows greater net earnings per mile for 1900 than for 1899, or for the average from 1890 to 1898. It cannot be said what effect these advances in rate, which prevailed during the last half of the year 1900, may have had upon the result for the entire year; but when it is considered that gross receipts, and therefore net revenues, enormously increased during that year, it is evident that there is little in the claim that increased cost of operation justifies these advances in rate.

"Previous to the act to regulate commerce there were 138 classifications in territory now covered by the official committee. A return to that condition would be intolerable. Moreover, the application of that act practically compels carriers to adopt a uniform classification, and it would be the height of injustice to forbid by one statute the thing which another statute in effect compels. But it is equally wrong and intolerable that a classification committee or a railway manager should be able by a stroke of the pen, without consultation with the public, without even informing the public, to arbitrarily change the rates at which freight traffic shall be handled. Carriers should have the right to agree upon a uniform classification and to amend that classification, but when hundreds of shippers complain that a public servant has perpetrated a wrong upon the public in the discharge of a public duty there should be some public tribunal before which inquiry can be had and by which redress can be administered.



### Safety Appliances.

"Since August 1, 1900, the date when the safety appliance act in all its provisions became effective, practically all the roads in the United States, as far as can be ascertained, have been using automatic couplers and air brakes in the operation of their freight trains. The Government has not undertaken to decide either the particular coupler with which freight cars should be equipped, the number or location of hand holds and grab irons, the height of draw bars or the number of cars to be provided with air brakes for the proper control of the trains, all these matters being left to the determination of the carriers.

"The law having been in full operation only about four months, its benefit in preserving the life and limb of employees cannot yet be determined with much accuracy, but from such of the public prints as were accessible it is found that up to December 1 there were 864 casualties, 255 of which were fatal. Of the total number it would appear that 618 were either purely accidental or resulted from apparent carelessness, 229 were caused by defective appliances, 482 occurred in the yards, 341 upon the road, 90 in switching and 234 in the operation of coupling.

"June 30, 1899, there were 928,924 persons employed on United States railways. During the year ending that date 2210 of such employees were killed and 34,923 were injured in railway accidents. The number of killed and injured in coupling and uncoupling cars was somewhat less in that year than in the preceding. Partial statistics for 1900 show, on the whole, some decrease in the number of accidents. To the end that every precaution may be taken and that no careless, indifferent or selfish individual may be permitted to endanger his fellows a system of public supervision should be maintained and a close inspection made of the rolling stock in service. The sum of \$15,000 appropriated by Congress to enable the commission to keep informed regarding the compliance with the appliance act was expended mainly in the employment of competent inspectors, whose reports include all such matters as tend in their opinion to increase the risk to employees in this hazardous service."

An interesting technical discussion of the safety appliances now in use is a feature of the report, as follows:

"From the inspectors' reports it is learned that upon many of the roads the smaller parts of the automatic couplers are neglected, such as cotter keys, clevis chains and knuckle pins; and the opinion is expressed that the tail end of the knuckle and the locking pin or block should be lubricated. This practice would result in less force being required to couple by impact and would extend the life of these parts. Reference is also made in the reports to an instance where both narrow and standard gauge cars are used on the same train. This makes necessary the use of the three-link coupling, which is especially dangerous. Another inspector asserts that there are too many different kinds of couplers in use, and that they are not placed on the cars with any uniformity as to the location of uncoupler rods, thereby causing great danger in coupling and uncoupling cars, in many cases the trainmen being required to run along with the car holding the lever up. Among the defects observed are the following: Coupler chains too long or too short; rods not adjusted to locks, and often no locks at all; short handles, rods placed on wrong side of the car and coupler not properly secured to the car. One report recommends that dead blocks on each side of draw heads be dispensed with and that engineers be compelled to give warning signal before putting on air brakes. Failure to give such warning is alleged to be the cause of so many brakemen being thrown from the cars.

"It is also stated that numerous accidents occur from carelessness through the men going between cars unnecessarily to raise the chain with their hands, that men have got into the habit of doing this instead of using the lever because many of the chains are too long, that many roads use chains made of split links and 'S' hooks, which should be discontinued for the solid link with the clevis. It is further reported that with many kinds of couplers, the parts of which are not interchangeable by reason of being out of order, the link and pin must be

used; that the practice of carding defects furnishes the men with an opportunity to be negligent; that the practice of not using more than 40 per cent. of air in trains, and scattering air brake cars through the train instead of placing them next to the engine should be condemned. Suggestion is also made that all trains should be inspected by an air brake inspector and not by the ordinary trainmen; that more care should be taken not only in the inspections, but in repairing defects when found, and, further, that a larger percentage of cars should be equipped with air brakes. These are not recommendations of the commission, but are deemed worthy of consideration by those interested as suggestions of men familiar with railway equipment.

"There has been criticism of the couplers now in general use for the alleged reason that they are not really automatic in many conditions and circumstances of railway operation, and because failure to make proper repairs renders the coupler a menace to the employee rather than an instrument of safety. Already an agitation has been begun for the use of other and better appliances. With this end in view the commission has been asked to order tests of automatic couplers in order to decide which coupler is best adapted to the general requirements of operation. The commission has given no encouragement to such requests and has replied that no provision is found in the law for such examination or any authority to decide in favor of a particular device; that the law has only gone into full operation and that there are as yet no sufficient data to show the alleged inefficiency of the devices now in use, and that further time is necessary to determine the truth or falsity of the statements made by those who are taking part in this movement. It is proper to state that none of the agitation in this respect or suggestion of change have come from organizations of railway employees or from any of the men whose employment renders them personally interested.

"It is believed that the complaints made result largely from the fact that these appliances, as before stated, are not maintained in proper condition, but we are confident that the system of inspection which has been adopted will result ultimately in greatly remedying trouble in this respect. The act leaves to the railroads the question of what particular devices should be purchased and applied to accomplish the desired result—namely, the saving of life and limb of employees and travelers. Certain it is that the improvements which have taken place in safety appliances, as well as other railway facilities, have been through the untiring efforts of those engaged in railroad operation under the law, and they have been adopted not only with a view to the safety of employees and travelers, but as necessary to the successful conduct and management of a modern railway.

"Since the law went into effect no complete or accurate information regarding accidents has been obtainable. As the railroads are merely required to make annual returns of the casualties to their employees, the value of the law can only be a matter of conjecture for a year at least. It may well be repeated that a large number of the accidents to employees can only be attributed to carelessness.

"The commission also says that any estimate of reduction in the number of accidents due to the adoption of these safety appliances must take into account the changes in conditions since 1893, when the law was enacted. At that time the average train load was about 184 tons, while in 1899 it had risen to an average of 243½ tons. The small cars and lighter locomotives then in general use have given place to much heavier equipment. Steel cars have been introduced capable of carrying 50 tons each. The use of heavy cars and engines in the same trains with old wooden and lighter cars subjects the draft rigging and couplers of these lighter cars to unusual strain, and results in many accidents which formerly would not have occurred. Of course the risk to the men employed in handling trains of cars of mixed capacity and greatly varying strength is much increased. This was a risk the employee was not called upon to take in 1893, when the law was enacted. The law can

only reach its highest value and efficiency when all interested—the railroads, the employees and the commission—are working to the common end of securing from its operation the greatest practical results." W. L. C.

### The Evans Multiphase Rotary Engine.

The accompanying illustrations show the general appearance and details of construction of an engine invented by James M. Evans, of Chicago, on which patents have been granted and others are pending.

The engine is the fourth in construction after the general design had been produced, and is of 100 horse-power, with 600 revolutions, 100 pounds of steam, one-third cut off, running noncondensing. The outside dimensions are 22 x 22 x 16 inches and weight 1000 pounds; diameter of steam cylinder, 17 inches; diameter of rolling piston, 12 inches; width of cylinder, 5 inches; speed of rolling

rotated to the opposite side of the divisional wall, which admits steam on the opposite side of the rolling piston and causes it to reverse. This in no way changes the working of the governor or the use of the steam and exhaust pipes. The reversing is controlled by a lever attached for that purpose.

Fig. 3 shows the valve and cylinder head removed, revealing the working parts within the cylinder. These consist of the crank shaft A, which is built up to allow of easily removing the working parts, and the rolling piston B, journaled upon the crank pin and revolving upon the pin, with the outer circumference rolling in contact with the wall of the cylinder. Three division walls, or slides, C, separate the cylinder into three 120-degree compartments, each of which has separate steam entry and exhaust ports. In the view the exhaust port shows an angular opening, and the plug on the right side of the upper pocket shows the position of the steam entry port. These ports are similar, each being plugged

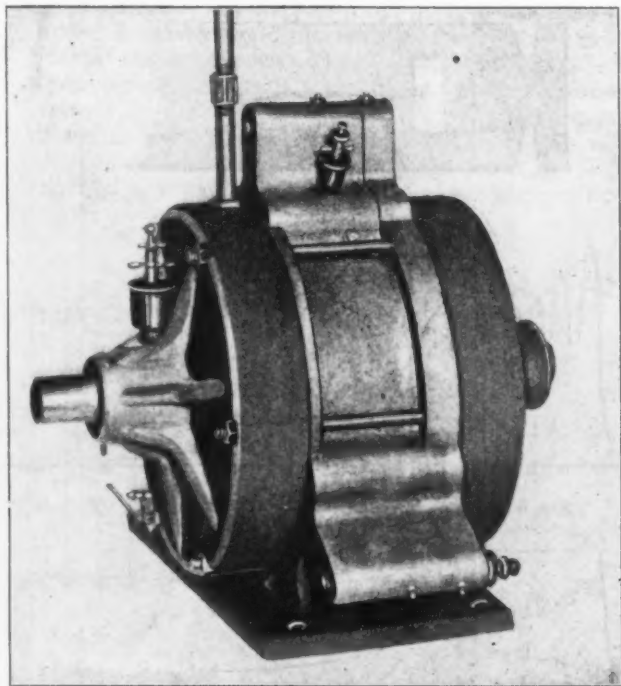


Fig. 1.—External View.

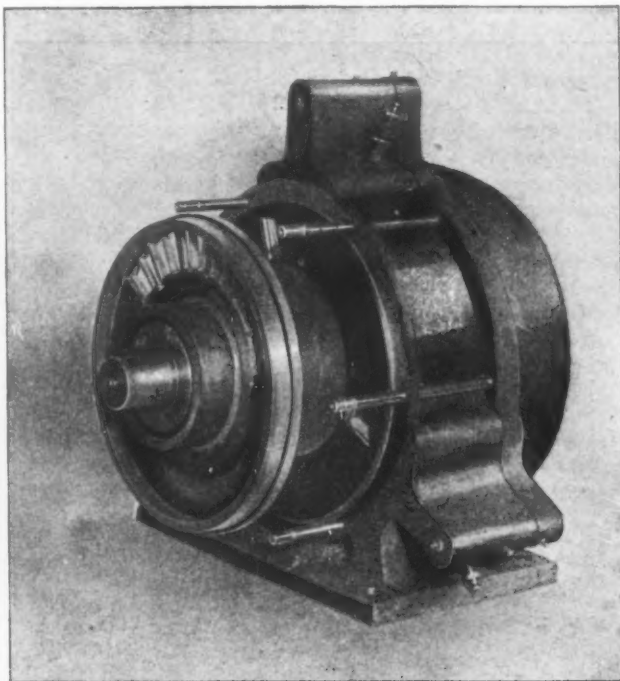


Fig. 2.—View Showing Cover of Steam Chest Removed and Steam Valve Pulled Out on Shaft.

### THE EVANS MULTIPHASE ROTARY ENGINE.

piston, 567 feet; stroke, about 16 inches; crank shaft,  $3\frac{1}{2}$  inches.

Fig. 1 is an external view showing the central cylinder and steam chests bolted to it on either side, so that the engine may run either way, taking steam from one side and exhausting on the other, the necessary difference in size of steam valve openings being easily and simply adjusted when changing from one to the other.

Fig. 2 shows the cover of the steam chest removed and the steam valve pulled out on the shaft, showing two of the three steam ports in the head, a central hub containing roller bearings for the main shaft, and the central cup shaped part of the steam valve necessary to fit over this hub. The valve consists of two parts, the disk as shown and a sliding annular ring containing the same number of openings as the disk upon which it is carried, and adapted to be automatically rotated by a governor, or to remain constantly at a predetermined angle of cut off, as desired. In the latter case the cut off may be varied while the engine is in motion, ranging from the full opening of 120 degrees, as shown, to a point where all but two of the openings are closed.

The engine is easily made reversible by using a three-way valve in converting the exhaust pipe into a steam pipe, and the steam pipe into an exhaust pipe, or the disks showing the steam port openings in Fig. 2 can be

on alternate sides. The division walls are held in position by shoes in grooves of the sides of the rolling piston and move in and out of the pockets in the cylinder as the piston rolls about the chamber. They are supported on both sides for their whole length by grooves in the cylinder heads, and also by the whole width of the pockets, one-third of the width of the slide always remaining within the pocket. The other letters on Fig. 3 are as follows: D is the cylinder, E the back wall or head of the cylinder, and F the exhaust valve. A rocking shoe, Fig. 4, is provided at the inner end of each slide, which maintains a steam tight joint between the circumference of the rolling piston and the inner end of its divisional wall. A balance plate of ordinary construction is used on the steam side of the division walls, to maintain tight pockets for the slides. The outer ends of the pockets are cored to form pneumatic chambers to receive and return the divisions, the pressure of air being calculated to receive and overcome the momentum of the slides and return them without undue force.

The piston is a disk of cast iron, bored to receive the crank pin and covered by two thin annular shells, serrated in the center of their circumference so as to move out against the cylinder heads E, Fig. 3, without allowing steam to leak under the ends of the division walls or slides. They are turned down over the sides of the pis-



ton so as to carry the grooves for the shoes of the slides and are fastened to the piston by flat annular diaphragms or rings of copper, B, Fig. 3, the outer circumference of the rings being anchored to the inside of the movable shells and the inner circumference clamped to the piston by clamping rings and screws. This gives a steam tight joint of great flexibility and allows the sides of the shells to be held against the cylinder heads by the steam pressure in the chamber. As the steam and friction surface may be readily proportioned to each other on the principle of a balanced valve, it will be seen that the packings on all points of wear are steam controlled and that they will remain tight to the limits of wear. The motion of the rolling piston is epicycloidal in all its parts, so that there is no wear on the cylinder wall and very little on the crank pin, and the motion of the shells rubbing on the cylinder heads will keep both heads and shells flat to the limits of wear. The packing on the ends of the slides rubs against the circumference of the piston shells, but owing to the construction and shape of

and all moving parts of the steam cylinder are oiled by the oil carried in by the steam.

In starting, the engine takes steam at boiler pressure in two of the compartments at once, but as it gathers speed the cut off reduces the angular opening of the steam admission valve until the cut off attained is sufficient to carry the load at a given speed, after which the steam is used expansively, the reduced valve opening admitting steam to the various chambers in rotation. The shape of the chambers is such as to obtain the full pressure upon the surface of the piston with a very thin layer of steam, and there being no clearance, the economy in this direction is marked. The condensation is also very small, as the steam is filling the live and exhaust side of the cylinder heads and the periphery is of such shape as to be easily jacketed. Compounding is simple, and is accomplished by placing the additional cylinders side by side with the high pressure cylinder.

The simple engine, as shown, can be used condensing, and when so used the entire surface of the rolling piston

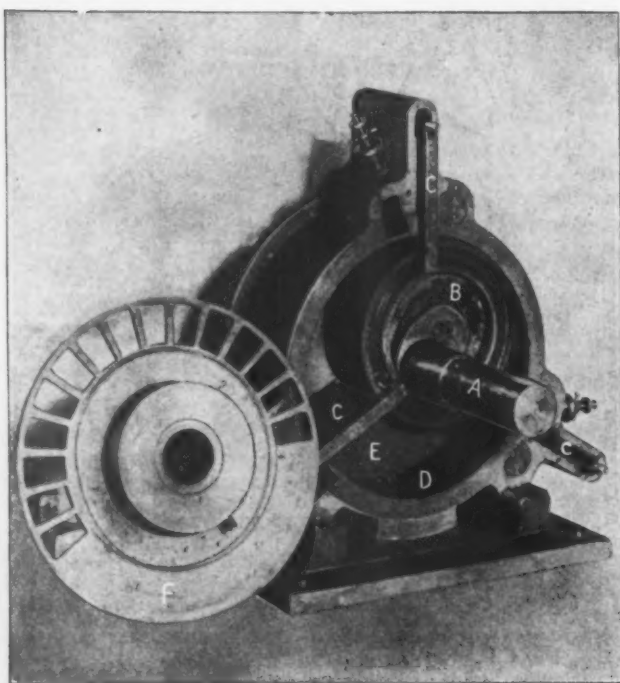


Fig. 3.—Valve and Cylinder Head Removed



Fig. 4. Rocking Shoe.

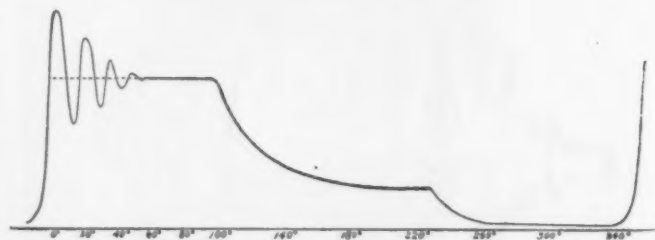


Fig. 5.—Actual Indicator Card—(00 Degrees Cut Off)

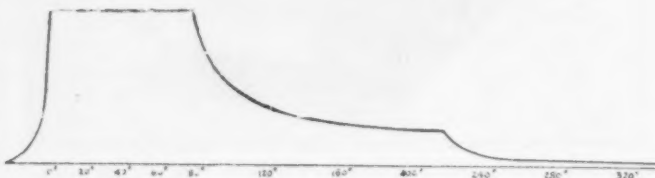


Fig. 6.—Composite Card Made up from 10 Cards—80 Degrees Cut Off

#### THE EVANS MULTIPHASE ROTARY ENGINE.

the slide and shoe, Fig. 4, it is steam controlled, and the great latitude of motion in the pocket will keep it tight until worn to the point where renewal is necessary. New packings are cheap and easily inserted. All curves are circular, and all planes are flat and right angled, making them easy of renewal with limited facilities. The piston speed is slow, much slower than is the case in many reciprocating engines, and slower than most experts would believe until they had calculated the epicycloidal curves with due reference to the diameters of cylinder and piston in relation to the crank throw.

By placing an actual crank in the engine the side pressure of the steam is taken off the shaft and utilized in holding the piston against the cylinder wall and revolving it, while any wear on the crank pin will not affect the working parts of the engine, as the piston is entirely controlled by the steam and the cylinder wall. The wear on the crank shaft boxes is therefore less than in the reciprocating type of engines, as the shaft is not subject to the side thrust of the ordinary engine at the ends of the stroke. With one chamber exhausting, one with steam expanding, and one taking steam at boiler pressure, or with two expanding, or in any other position, the resultant of the forces maintains the thrust always at right angles to the throw of the crank. The steam valve contains large, flat surfaces and the valve seat

exerts power to operate the crank shaft. The surface upon which steam pressure is exerted is equal to a plane whose length is the sum of the chords of the arcs of steam area, multiplied by the width of the cylinder, which gives a very large pressure surface to be acted on by a very thin layer of steam.

An actual measurement of the piston chords showed  $11\frac{1}{4} \times 7\frac{1}{2} \times 5$  inches for the steam side, and  $3 \times 10\frac{3}{4} \times 5$  inches for the exhaust side of the piston, or 93.75 inches steam pressure and 68.75 inches on the exhaust side of the piston. The length of these chords varies, as the contact point of the piston and cylinder are constantly changing, but the above will indicate that the surface of mean effective pressure is much larger than is usually the case with rotary engines.

The steam exerts a very gradual increase of pressure upon the piston, as the steam entry ports are close to the division walls, and as the point of contact rolls past the port the surface exposed to boiler pressure increases steadily until the point of cut off is reached, when the pressure gradually decreases until the exhaust ports open, obviating the heavy blows caused by the steam striking the full surface of the piston of the ordinary reciprocating engine. The epicycloidal motion of the piston allows the chamber to enlarge about one-half after the angle of one-third revolution has been passed, hence



steam may be admitted at boiler pressure for one-third of a revolution, and then be used expansively after that for another third of its revolution. This is true of each of the three compartments in each revolution, making six thirds of a revolution in which steam is being used at boiler pressure and expansively.

It will be understood by this that steam at boiler pressure can be used on one-third of the circumference of the piston during its whole stroke; at the same time, steam being expanded from boiler pressure to atmospheric pressure is being used on another third of the circumference of the piston during the stroke, while steam is being exhausted from another third, for two-thirds of the time during a revolution. If a condenser is used it would produce the effect of the vacuum for two-thirds of the time during a revolution.

As the area exposed to boiler pressure increases in one chamber the preceding one decreases its pressure by expansion, thus maintaining a nearly constant pressure on the crank shaft.

The engine will start with full boiler pressure on two chambers, and cut off as speed is attained. This gives by actual test when starting a pull of about four times the power used when running regularly. This is a particularly valuable feature for reversing engines, or engines carrying loads that fluctuate greatly.

The exhaust valve, shown leaning against the engine in Fig. 3, demonstrates that ample time is given to al-

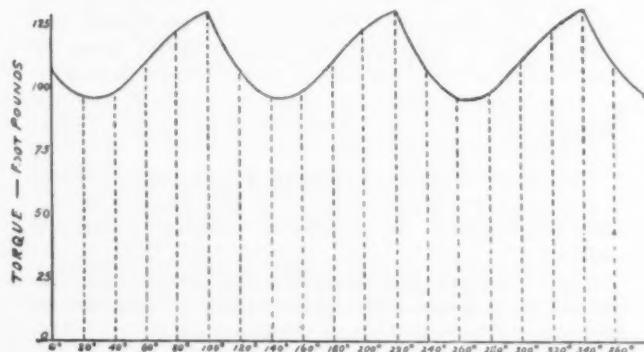


Fig. 7.—Torque Curve—100 Degrees Cut Off.

#### THE EVANS MULTIPHASE ROTARY ENGINE.

low of the escape of steam and thus all liability of back pressure is avoided, as the steam has twice as long a time in which to escape as in the ordinary engine. The engine will run from 20 to 1000 revolutions per minute and is noiseless and without vibrations. It will start at 5 pounds steam pressure and attain 400 revolutions per minute, running without load, and the indicator cards show no drop in the steam line at that speed and pressure. The engine was run noncondensing, at 600 revolutions per minute, with 100 pounds of steam, one-third cut off, with a steam consumption of 21.17 pounds per horse-power per hour. With one-fourth cut off, and other conditions unchanged, the consumption was 18.01 pounds per horse-power per hour. The friction on full load was about 8 per cent., and with no load  $1\frac{1}{2}$  per cent., showing a friction varying with the load. This varying friction is due greatly to the use of roller bearings throughout the engine.

Indicator cards are shown herewith, all of them having been taken from the engine in actual use, as shown by numerous cards of the same outlines, taken at other times. Fig. 5 is a card taken at 100 degrees cut off. Fig. 6 is a composite card made up from 10 cards taken at 80 degrees cut off. Fig. 7 is a torque curve at 100 degrees cut off.

The simplicity of the engine will be gathered from the foregoing description. Its whole working equipment may be classed as four movable parts, all of which are self adjusting.

The engine is being manufactured by the Evans Multiphase Rotary Engine Company, with an authorized capital stock of \$5,000,000, whose office is at 84 La Salle

street, Chicago. James M. Evans is president, C. G. Hellick vice-president, H. Baldwin secretary, and F. S. Wilson treasurer. They are preparing to supply a full line of sizes, which will be made simple, compound and triple expansion, and run at from 100 to 1000 revolutions per minute.

### Canadian News.

#### The Cramp Ontario Steel Company.

TORONTO, January 5, 1901.—Five hundred thousand dollars of 7 per cent. cumulative preferred stock of the Cramp Ontario Steel Company is offered on this market by a Toronto broker. The whole issue of \$3,000,000 preferred stock and \$2,000,000 common stock is, it is said, being underwritten in New York and Philadelphia. The portion of the preferred issue now offered in Canada is at \$100, with a bonus of 25 per cent. common stock. The directors of the company are Wm. M. Cramp, Philadelphia; Geo. O. Angell, Philadelphia; Hon. Sir Charles Herbert Tupper, Victoria, B. C.; Hon. J. R. Gowan, Q. C., Barrie; F. H. Clergue, Sault Ste. Marie; John J. Long, Collingwood; W. C. Matthews, Toronto; A. McDonald, Toronto; J. A. Currie. Walter Kennedy of Pittsburgh is the consulting engineer. The company are organized for the purpose of establishing blast furnaces, steel plant and rolling mills, at Collingwood, a port on the Georgian Bay. They are to commence operations with a plant having a capacity of 200 tons per day. While the manufacture of merchant pig iron is to be provided for, the purpose is to convert most of the output of the furnace into steel. Besides the furnace of 200 tons capacity, there will be a steel plant of four 30-ton open hearth furnaces.

Mr. Clergue's presence in the company points to the likelihood that the ore will, as far as possible, be furnished from the Helen mine in Michipicoton. In the prospectus, indeed, it is stated that that will be the source of the supply.

From the town of Collingwood the Cramp Ontario Steel Company get a cash bonus of \$115,000 and a free site of 50 acres of land with a frontage of 800 feet on Collingwood Harbor. The company's assessment is not to be more than \$700,000 for 30 years, and for one year after completion the plant is to be exempt from taxation. On their part the company are bound to establish a blast furnace, steel furnaces and rolling mills requisite for turning out 200 tons of product per day, the product to consist of pig iron, ingots, steel plates, structural shapes and rails, and to employ continuously 600 men. Seven hundred thousand dollars must be expended in the building and equipping of works. The bonus is to be paid when the works are completed and approved.

A demand for the products of the company is likely to be afforded by the steel shipbuilding company that have begun operations in the town. When that shipyard is finished it is expected to be one of the best equipped on the great lakes. The dry dock in connection with it is being lengthened. The keel of a 350-foot passenger steamer for the Benly Line is being laid there, and three others are to be laid early in the present year. Captain Alexander Macdougall of Duluth, inventor of the whaleback, is connected with the company. He was in Collingwood quite recently.

It is believed that there are great stores of natural gas under the limestone deposit about Collingwood, and a syndicate has begun to drill for it at a point about 10 miles out of town. The syndicate is strong financially and has about 40,000 acres under lease. The first well was drilled to a depth of 1800 feet, when the drill broke. The second well is now down 400 feet. If any considerable resource of gas is struck it is calculated it will prove a great economy in the works of the Cramp Ontario Steel Company.

#### Dominion Iron & Steel Company's Plans.

Another meeting of the Dominion Iron & Steel Company directors was held at Montreal on the 28th ult., at which were present Messrs. Whitney, MacKeen, Dimock, Moxham, Pearson and Ross. Arrangements were made for a shareholders' meeting on the following day to ratify the resolution providing for the issue of \$5,000,000 new stock and to receive reports on other matters.

The shareholders' meeting was duly held and the decision to increase the subscribed capital from \$15,000,000 to \$20,000,000 was ratified. The additional \$5,000,000 capital consists of preferred stock, and is for the purpose of establishing a plant for the manufacture of steel rails and ship plates in connection with the company's other works at Sydney. The full amount of the net issue, it is said, is underwritten. Mr. Mosham, the vice-president and general manager, stated that the construction of the new works would be begun at once, and that by the end of the present year rails and plates made in them would be placed on the market. He submitted the following report, covering the points as to ore supply, limestone, coal and labor:

"Iron Ore: The developments at Bell Island have bettered the promise. The drill hole put down in the most doubtful portion of the property has shown that the ore at this point exists in a solid bed, of great depth, low in silica and high in iron. It is of better quality than we had counted on as a standard. Dealing with the delivered cost of this ore, as you know we found early this season that we could not get the ore handling plant completed in time to get in this season's ore and so we had to receive and handle the ore needed for winter work as best we could and at serious disadvantages, and we sustained the expense of a long and costly strike at Bell Island. Notwithstanding that all these unusual items have been charged off into a small tonnage—say, 120,000 tons—the cost of the ore, delivered at our dock on steamer (not unloaded) was only \$1.62 a ton. Our estimate of what it will cost when everything is working smoothly is \$1.25. The result shows our estimate to be a safe one. As a comparison I may say that the cheapest ore ever delivered to the Cleveland district was in 1897 and 1898, and the cost was \$2.21 a ton f.o.b. steamer, delivered.

"Limestone: we have two supplies, Georges River and Marble Mountain. For this winter we are getting the stone from Georges River at a cost of 60 cents a ton. This is within our estimate. The Marble Mountain quarry is nearly equipped, and next spring our supply will come from there.

"Coal: We have not yet finished the coal washing plant, nevertheless we are making an excellent quality of coke in our ovens, using the coal just as it comes from the mines. We are down to 30-hour coke (which is the basis of our estimate), and can now say with safety that we will be able to work a shorter basis coke. The coke is physically all we hoped for and while high in sulphur, as expected, is lower in even this than we expected in unwashed coal. The indications are for a coke out of washed coal that it will be fully equal to the celebrated Connellsville standard. The sulphur will be no higher; the ash lower; carbon higher and the physical structure promises to fully be the equal.

"These points are technically the keystone of our work, and in all of these enough has been done to let us feel that our future is on a sure basis and that it is beyond the field of conjecture.

"As to the cost of labor: It will of necessity be heavy at first, as it will take time to bring it up to the ordinary standard of steel working, but while this is true, it leaves no need of doubt as to the future. The plant we are building is constructed with all modern labor saving devices and as low a cost sheet as that of any modern plant in the States is only a matter of time.

"In conclusion I think it safe to say that we are certain of a safe profit from the first and can look for a very handsome profit after the first year."

It was stated at the meeting that the first of the company's furnaces would be blown in about the middle of this month. Considerable sales of iron have already been made in both the Canadian and the English market at satisfactory prices.

#### Maritime Steel Shipyards.

After their interview with Premier Tweedie at St. John, N. B., on the 22d ult., the promoters of the shipbuilding enterprises met him and other members of his Government on the 28th in connection with the same subject, that is, the granting of Provincial aid to the undertakings. Charles Burrill and B. F. Pearson, the latter

being a director of the Dominion Iron & Steel Company, laid their views before the Government. With them were John H. Thompson, Geo. McAvity, Geo. W. Jones and Frank Stetson of St. John. They received encouragement from the ministers. The latter welcomed the ideas of reviving New Brunswick's old shipbuilding industry, the material to be steel, instead of, as in former times, timber. The Premier stated that such an industry, established in the Province, must necessarily have the support of the Government, and intimated that legislation favorable to it would be introduced next session if conditions satisfactory to the Government were fulfilled. In the course of the interview it was stated by the promoters that it is intended to establish plants of about equal magnitude at St. John and Halifax. It was further explained that the capital stock would be \$5,000,000, and that from 2000 to 3000 men would be employed at each place. Within a year, it was said, the plants would be under way.

#### New Industries.

A wire fence factory is about to be built at Owen Sound, Ont. P. H. F. Strathy, a manufacturer of wire fence at Welland, is at the head of the enterprise. The capital stock of the company is to be \$200,000. At first the galvanized wire will be imported, but the charter is to include the right of manufacturing the steel rods, and works for that purpose will eventually be added.

The new corundum mill, established in Raglan township, Ontario, in the heart of the corundum deposits, has just started operations. It is said to be the largest corundum mill in existence, its daily capacity being 15 tons, reclaimed from 100 tons of rock. Orders have been received from engineering works in England and the United States. George C. Edwards of Bridgeport, Conn., is president of the company.

The Canada Foundry Company, Toronto, have decided to construct a large machine shop and foundry in Toronto next spring, their present premises being too small.

The Pittsburgh Reduction Company's works at Shawinigan Falls, Quebec, will soon be ready to manufacture aluminum. They will draw their material from Ontario's corundum fields.

According to a Montreal dispatch to the *Toronto World*, there is a strong probability that coke ovens on a large scale will be established in Montreal. Cape Breton coal would be used. Already there is a large movement of that coal to Montreal. The new enterprise is said to be warranted by the demand for coke that existing and forthcoming iron furnaces will maintain, as well as by the demand on account of British Columbia smelters.

#### The Stove Combine.

John H. Tilden of the Gurney-Tilden Company, Hamilton, Ont., went to Chicago in the latter part of December in connection with the stove combine business that has been pending some months. Dr. McCauley of Chicago is the man who formed the syndicate. The amount of capital required was estimated at \$7,500,000. In Hamilton alone \$300,000 would be subscribed. It was expected that everything would be ready for the transfer at the beginning of the present year. Mr. Tilden returned a few days ago. The business, he says, will be closed before the present month is half through.

#### British Columbia Shipbuilding.

A question which is receiving the serious consideration of the interests concerned in British Columbia is how to increase Canada's share of the trade of the Pacific. That question was the leading subject at a meeting of the Council of the British Columbia Board of Trade, held some days ago at Victoria. W. A. Ward, the president, very clearly reviewed the causes which now operated against British Columbia and Canada at large as a competitor for the trade with Australia. While that market is proving of more and more value to the Americans Canada is reaping comparatively little benefit from it. American ports, Mr. Ward declares, have the preference with the vessel owners, and these charge higher rates from Vancouver and Victoria than from the



Puget Sound ports. The only way in which Canada can hold its own on the Pacific Coast, he says, is to build its own vessels, and in order to do this Government help is required. He stated that he had learned from one of the members of the Provincial Government—Hon. Mr. Eberts—that a measure would be introduced into the Legislature this session for the purpose of promoting the building up of a merchant marine on the Pacific. Mr. Ward considered that the Dominion Government should assist in the same object. Hence a shipping subsidy bill will probably be urged by British Columbia, as the Board of Trade represents the whole Province. His ideas were well received, and a committee was appointed to prepare a report on the subject.

The contract for repairing the British iron bark "Dunreggan" was secured by the Albion Iron Works of Victoria, B. C. Tacoma and Seattle shipbuilders tendered for it, but the Albion Works underbid them by \$15,000. The work is to be completed in 45 days. Eighty plates are to be taken out, 30 of which are to be rerolled and the others replaced.

A shipbuilding company, with the Bullens of the Esquimaux marine ways, Mr. Woods of the Moodyville lumber mills, and other well-known British Columbia business men as promoters—is being formed at Victoria. A subsidy is being sought from the Dominion Government.

C. A. C. J.

### The Foundrymen's Association.

The one hundred and fourth regular meeting of the Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, Pa., Wednesday evening, January 2, 1901, Vice-President James S. Stirling occupying the chair.

The first meeting of the new century was fairly well attended. Among those present may be mentioned:

Jas. S. Stirling, Harlan & Hollingsworth, Wilmington, Del.  
 W. H. Echternach, Girard College, Philadelphia.  
 G. T. Johnson, Howe, Johnson & Co., 719 Drexel Building, Philadelphia.  
 J. S. Keightley, Geo. V. Cresson Company, Philadelphia.  
 E. Zwick, Geo. V. Cresson Company, Philadelphia.  
 W. E. Arnold, L. & R. Wister & Co., Philadelphia.  
 A. W. Griffith, Diamond State Steel Company, Wilmington, Del.  
 Geo. Rockett, Diamond State Steel Company, Wilmington, Del.  
 W. B. Hughes, A. & P. Roberts Company, Pencoed, Pa.  
 S. H. Ralston, A. & P. Roberts Company, Pencoed, Pa.  
 C. H. Haesler, Chicago Pneumatic Tool Company, Philadelphia.  
 C. S. Matthews, Camden Iron Works, Philadelphia.  
 C. H. Newcomb, Matthew Addy & Co., Philadelphia.  
 C. S. Koch, Wm. Sellers & Co., Philadelphia.  
 W. P. Pressinger, New York Air Compressor Co., New York.  
 Thos. Alcorn, Chicago Pneumatic Tool Company, New York.  
 Geo. C. Davis, chemist, Philadelphia.  
 Theo. B. Rohrman, Philadelphia.  
 Robt. W. Trump, Philadelphia Stove & Iron Foundry Company, Philadelphia.  
 A. G. Warren, J. W. Paxson Company, Philadelphia.  
 N. W. Shed, Thomas Devlin & Co., Philadelphia.  
 Wm. Hanson, Pennsylvania Iron Works Company, Philadelphia.  
 I. R. Newkirk, J. B. Newkirk & Co., Philadelphia.  
 W. S. Hollowell, Harrison Safety Boiler Works, Philadelphia.  
 W. H. Ridgway, C. Ridgway & Son, Coatesville, Pa.  
 T. B. Harkins, T. B. Harkins Foundry Company, Bristol, Pa.  
 J. A. Burr, Burr & Houston Company, Brooklyn, N. Y.  
 G. T. Mash, South Baltimore Car Works, Baltimore, Md.  
 A. C. Pessano, Geo. V. Cresson Company, Philadelphia.  
 E. E. Brown, E. E. Brown & Co., Philadelphia.  
 J. Mills, Jr., Abendroth Bros., Port Chester, N. Y.  
 J. M. Payne, Crocker Bros., 1021 Stephen Girard Building, Philadelphia.  
 L. A. Hickley, Davis Coal & Coke Company.  
 Howard Evans, J. W. Paxson Company, Philadelphia.  
 H. O. Evans, Thos. Devlin & Co., Philadelphia.

Upon motion the reading of the minutes of the previous meeting was dispensed with. No unfinished business was before the association. Application for membership was made by L. & R. Wister & Co., 672 Bullitt Building, Philadelphia, manufacturers and dealers in pig iron, steel scrap, coal and coke, &c., and on motion of Mr. Evans, the secretary was instructed to cast a favorable ballot for their election.

The Executive Committee communicated to the association, through the secretary, the fact of an amendment to their by-laws, lately adopted by the Pittsburgh Foundrymen's Association, by which the dues were sufficient-

ly increased to cover the yearly dues of the American Foundrymen's Association, thereby making a member of the Pittsburgh Association also a member of the American Association.

After discussion it was resolved, on motion of Mr. Pessano, "That the secretary be instructed to inform all the members of the action of the Pittsburgh Foundrymen's Association, and obtain a letter ballot on the subject, and present same for special action at the next meeting of the association."

No other business being before the meeting, W. P. Pressinger of the New York Air Compressor Company was introduced, and a paper read and illustrated by means of a number of lantern slides. It is entitled "Pneumatic Tools and Appliances in Foundry Service." At the conclusion of the reading of the paper a number of views of automobiles, auto-trucks and other appliances using compressed air as power were shown. Considerable discussion followed the reading of the paper. J. S. Stirling said that he had a pneumatic hoist in use and experienced considerable difficulty in getting positive movement in either the up or down stroke.

Mr. Evans acknowledged that there had been considerable difficulty in the point mentioned by Mr. Stirling. He had experienced it himself, but had overcome the difficulty by an oil governing system, which has proven itself entirely positive. On test with suspended weight for 24 hours no variation in the position of the load was noticeable. This hoist was used for carrying iron from the cupola to the molds. Three ladles were handled, and the work of eight men satisfactorily performed with three. The action of the hoist in emptying the ladle was perfectly positive. Mr. Ridgway reported that he has made oil governed hoists up to 5 and 10 ton capacity and has had no trouble with their action. The movement is positive, but better results and at a much more reasonable expenditure have been obtained with steam hoists, hooked direct to the boiler, by which the installation of an air compressor was eliminated. Air compressors were more or less intricate, and one to meet the usual foundry requirements was yet to be made.

Mr. Pressinger held that properly installed air compressors are satisfactory if proper care is exercised and the apparatus frequently tested. Leaks in the system are not as readily noticed as in a steam system, and greater wastage occurs when piping is faulty or in bad repair.

In reply to the question, "How small a plant can introduce with profit the pneumatic system for tools and hoists?" Mr. Pressinger replied that none are too small. Plants have been installed where only two hammers and a hoist were originally employed, but which have since been greatly added to. The cost for such an equipment of compressor, receiver and piping should not exceed from \$350 to \$400.

Mr. Ridgway reported that there is a small engine made, the Duke engine, which can at small expense be geared direct to the ordinary crane, and either compressed air or steam used, thereby converting the old style crane into a power one. He had seen these engines operating with steam for several years and giving perfect satisfaction. Small cost is entailed, as it is stated that a 10-ton crane can be equipped for from \$50 to \$60, and they are made up to 25 or 30 horse-power capacity.

In reply to the question by Mr. Pessano whether there is any established point of compression, one at which the best work is done, using the various pneumatic tools, Mr. Pressinger replied that the best working pressure is from 80 to 90 pounds, except for riveting, when 100 pounds pressure is necessary.

A vote of thanks was tendered Mr. Pressinger for his interesting paper, and adjournment followed.

The members then proceeded to the roof garden of the club, where luncheon was served. J. S. Stirling, acting as toastmaster, called on a number present for speeches. Responses were made in both serious and humorous vein, and the first social session of the association in the new century was the most entertaining that has been held for some time.

In his testimony before the Industrial Commission on Saturday, Prof. Frank A. Parsons argued in favor of the



Government ownership of railroads, for the reason that it would prevent the many discriminations in rates and privileges now existing and would therefore be to the interest of the public. While the cost of operating railways had decreased materially in the past 30 years, he declared that there had been practically no reduction in local rates, though there had been in through rates. He also favored Governmental ownership of telegraph and telephone lines for substantially the same reasons.

### Notes from Great Britain.

#### Continued Fall in Prices.

LONDON, December 29, 1900.—The English market is still clattering downward. Two months ago I announced that, in the Midlands, makers were selling under association prices. Since then the price of unmarked bars has gone down from \$53 to \$40. Last week there was an official reduction of the unmarked bar association by \$3.75 per ton. Even as it is, makers are taking contracts at an even lower price. In any case just now there are no buyers and all the markets are flat and unresponsive. This remark applies to the Midlands, to Lancashire, to the northeast coast, and to Scotland. There will probably be a slight revival of buying, and possibly a few contracts toward the end of January, but my impression is that purchasers will only buy from hand to mouth for some time to come. The Midland official quotations at the time of writing are as follows: Marked bars, \$52; Earl of Dudley's brand, \$55.50; second grade, \$48; common unmarked, \$38; North Staffordshire unmarked, \$40; sheets, singles, \$42; doubles, \$42.50; trebles, \$45.50; nail rod and rivet iron, \$42.50; Bessemer steel billets, \$27.50; best Siemens, \$28; mild steel bars, \$41; steel plates, \$40; steel girders, \$40; steel angles, \$40; Staffordshire pig iron, \$11.50.

#### Coal Contracts.

I announced last week that the railway companies had got a considerable concession from the coal owners in the way of price. Two days ago the coal owners of South Yorkshire signed contracts with the railway companies for the supply of locomotive fuel for the next few months, commencing January 1, at 13 shillings 6 pence per ton, as compared with 16 shillings 6 pence, the price of present contracts. It is estimated that this reduction will relieve the railway companies of about one-half of the extra charge which has interfered with dividends for the past half year, but the price is still nearly a dollar over the average contract price for this class of coal.

#### Economic Alliance Against America.

An article by M. Paul Leroy-Beaulieu in the Christmas number of the *Neues Wiener Tageblatt* has created considerable interest in France, Germany and England, and the numerous papers of these countries have been discussing the matter. M. Paul Leroy-Beaulieu calls for an economic alliance of the European Continent, because of the growing power of the United States. He points out that the United States, with their immense territory, their mineral wealth, their great rivers and sources of water power, their population of 76,000,000, which shows a regular increase of 12,000,000 in every decade, and which consequently will have reached about 100,000,000 in the year 1920, together with their rare spirit of enterprise and creative force, are on the point of becoming by far the most important economic factor in the world. He says: "They may henceforth be regarded as the first industrial nation, and their superiority will become more strikingly evident from year to year. The United States, moreover, will very soon have a considerable mercantile marine. What part will divided Europe play in presence of this young giant? The Americans are already accustomed to regard Europeans, and more particularly those inhabiting the Continent, in about the same light as they do Orientals, who vegetate in dreams of the past." I do not think there is much chance of M. Leroy-Beaulieu's dream materializing.

#### American Engineering Progress.

If further proof were needed that English engineers are anxiously watching American developments, it

would be found in the fact that the *Times* again returns to the subject of American engineering progress, and has started a second series of articles, on the same lines as those which appeared in the spring of 1900, and entitled "American Engineering Competition." The articles are apparently by the same writer. They are written with real literary ability and with considerable insight. Although he is evidently an Englishman, he watches American developments with sympathy and admiration. This week two articles have appeared, the one dealing with present conditions and the second with educational influences. He makes two or three points with which most observers will, I think, agree. For example, after pointing out the immense natural resources of America, he says: "Thus, in the iron and steel industry, it is the view of some that the natural advantages of the United States are so great that the steel trade must largely fall to America, and that we should do well to get our supplies from that country. This would be an extension, though too great an extension to be desirable, of the lines upon which we have hitherto gone, of obtaining raw material from abroad and working it up into the finished article for the world's markets. The Americans, however, take quite a different view of the matter. They say, 'We do not care so much to sell you semi-manufactured products. We would rather keep our iron and steel at home until it is made into steam engines, machine tools, agricultural implements, dynamos, electric motors, and other profitable things of the kind.'" I think this very fairly sums up what may be termed American commercial policy. In dealing with educational influences, he points out that while in this country we pay homage to old age, Americans go on the principle that youth is the season of energy. Mr. Lecky says in his introduction to "Democracy and Liberty:—"The respect for old age is one of the strongest of English instincts and is often carried so far that it will be found that men only attain their maximum of influence at a time when their faculties are manifestly declining." The writer in the *Times* says that in nearly all the large manufacturing concerns the managers are all young men. It would thus appear that English habits approximate more to the Chinese! Intellectually, the *Times* correspondent seems to think that the Americans have learned to concentrate their minds on any problem immediately before them and that their memories are not trammelled by having learned by rote things that have no ultimate meaning to the learner. Again, while doing justice to the high position which purely classical studies occupy in the curriculum of certain educational establishments in the United States, the writer admires the frank and open way in which young students talk of business problems—the outcome of equally frank conversations with their fathers as youths. The writer concludes his letter on educational influences with this remark: "To me it appears one of the most disquieting factors in the problem before us that the United States have trained a body of young men who are determined to make their country great and who have been educated to a living, practical interest in the things needful to that end."

S. G. H.

**The Pittsburgh Valve, Foundry & Construction Company.**—In the Consolidation Supplement recently issued by *The Iron Age* a mistake was made in stating the capitalization of the Pittsburgh Valve, Foundry & Construction Company. The company were organized in October, 1900, under the laws of Pennsylvania. They are a close corporation with but one kind of stock, of which \$1,150,000 was authorized and fully issued.

Acting upon the complaints of many householders living along the line of the new Central London Railway, who complain of vibration caused by the running of the trains through the tunnel, the British Board of Trade has appointed a committee to investigate the matter and ascertain what alterations can be devised to remedy the trouble. American engineers in London are of the opinion that the railway is using electric engines that are three times heavier than necessary to perform the work they are called upon to do.

# The Iron Age

New York, Thursday, January 10, 1901.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

## The Unification of the Railroads.

Startling changes are occurring in the railroad situation. We have had consolidations of railroad lines without number ever since railroads began to be built, so that consolidations are not new. All the great systems are composed of lines which were built independently and were absorbed one by one. It will be recalled that several years since the tendency to consolidate competing roads was so strong that laws were passed quite generally by the States forbidding parallel lines from being united under one ownership or management. Railroad managers and capitalists interested in railroads have not been balked by such a trifling obstruction as a State law, but are accomplishing practically the same purpose by a different method. Some consolidations are now being made when they do not conflict with prohibitory statutes, but the principal method at present in vogue is to secure a large stock interest in a road and control its management. The line thus remains nominally independent, continuing its organization, but its management in harmony with other roads controlled by the same group of capitalists is assured. The recent developments in this direction have been amazing. Properties have been secured by a combination of banking interests and railroad magnates which were regarded as unpurchasable. No undertaking appears to be beyond the power of this combination, which is believed to be the most colossal in resources ever known in the financial world. Its members are men of great business sagacity, who have demonstrated their qualities of leadership by long years of success, and their faith in the future should be inspiring. They are not now buying up bankrupt properties, whose stock is so cheap that control can be secured at a small outlay, but they are acquiring railroad systems on a permanent dividend paying basis, necessitating heavy premiums to be given. To attempt such projects at this time, when all railroad stocks are selling at record prices, would seem to be unwise, but for the belief that these leaders of finance see a golden era opening in which properly managed railroads will prosper more than at any time in the past.

When so much has been accomplished, it is easy to believe that more can be done. Other railroad properties will doubtless be secured until the railroads of this country are in such hands that rate wars will be unheard of, rates will be strictly maintained and the stockholders will receive regular returns on their investments. This is the end toward which the great banking interests are working, and in endeavoring to accomplish it they are having the very hearty co-operation of capitalists with heavy investments in railroads. This is a laudable purpose, if it is the only way in which stability of rates can be secured and railroad property be made to yield some return to those who have invested their money in railroad securities. The railroads constitute a very important interest in our financial and industrial welfare and much depends upon their prosperity. If they are unwisely managed, and their revenues are sacrificed

through the desire of officials to secure greater traffic, which at times can only be done by slashing rates, the management is compelled to economize in making needed improvements and the manufacturing interests depending on railroad patronage suffer from loss of business. The country as a whole is always more prosperous when the railroads are free buyers of all kinds of material and supplies and are distributing dividends among their stockholders. As agreements by officials to maintain rates have proved valueless, and pooling is prohibited by law, the method now pursued of bringing railroad ownership into close alliance, although expensive, appears to be justifiable.

The plan, of course, has its sinister side. Shippers cannot fail to regard the tightening of railroad relations with distrust, as it necessarily means higher rates than those to which they have been accustomed. Yet it is probable that rates may not be advanced materially. If the railroads can work themselves into such a condition that they can maintain present rates absolutely, and are not obliged to make heavy concessions to large shippers, that in itself would mean a gain in their revenues. If, however, an attempt should be made to fix rates on a considerably higher level, much injury could be done and many manufacturing and producing interests could be placed at a serious disadvantage. But a safeguard exists which can be brought to bear should such a contingency arise, and that is the national and State control of railroad rates. Years ago such a safeguard did not exist. Further, if railroad investments under the new dispensation prove to be excessively remunerative, competing lines will assuredly spring up. Capital is ever on the lookout for such opportunities.

## Gold and Trade.

The world's production of gold in 1900 is estimated at \$256,000,000. This is larger than any previous year's production except in 1898 and 1899. Of course the decrease is easily explained by the South African war. The United States and the nine Governmental banks of Europe had about \$162,000,000 more gold at the end than at the beginning of the year. But while the statement for the United States includes all monetary gold, all gold coin and all Treasury bullion, the figures for the nine Governmental European banks cover only their deposits; not the whole amount of gold in their countries. The increase in the world's supply of gold money, therefore, may be put considerably above this. The Mint estimates the industrial use of gold in 1898 at \$65,000,000; if it were \$70,000,000 in 1900 the addition to the monetary gold last year would have been \$186,000,000, subject to correction as to the total product, and it is not unlikely that the gold money outside of the United States and the nine Governmental banks increased \$24,000,000 last year.

Apprehensions regarding the effect of the South African war upon the world's monetary supply have not been justified by the event. A part of the loss in South Africa has been made good by decided increases in the United States and elsewhere. The average annual increase of the world's supply of gold money from 1893 to 1900 is estimated by the Mint at about \$134,000,000; the increase in the visible supply last year was certainly over \$160,000,000, so that the decreased production has not decreased the yearly gain in the supply of money at all.

But had the increase been much less than it was it is not certain that business would have suffered from lack of the means of exchange. The disarrangement of business was threatened much more by the absorption of



money by the British Government than by the stoppage of the Transvaal mines. But the British Government disbursed the gold almost as fast as it took it, and while much of it was disbursed at distant points, a very large part of it was disbursed in London itself, and the transaction was very much like that of one man lending another money in the form of a check upon the bank where both of them keep their deposits. The forebodings expressed in London 15 months ago have not been realized, but the diversion of wealth from productive enterprises to the waste of war cannot fail to have its effect upon trade and the establishment of new enterprises.

Besides being a gold producer, the largest in the world last year, and a large exporter of agricultural products, the United States has recently become a large exporter of manufactured goods, and with the removal of the menace of silverism it is the most attractive large field for investment in the world, so that it is fast assuming the position of a leading creditor nation, and, being unable to sell us other things, Europe is selling us our own securities when pinched for ready cash. So there is some justification in foreign monetary centers for the fears of a currency shortage, but this shortage would not be really a lack of money in the world, even if the supply of gold fell off still more; it would be the shortage of a debtor, who has not cash, not because there is not cash enough, but because he has been obliged to spend a great deal of money and has meager means of providing himself with money except by selling property which he would be very glad to hold if he could.

#### South African Orders for American Manufacturers.

If we should look for signs of the decay of the British nation and of its decline from the high position it has held for centuries in production and distribution, we would be likely to find them most strikingly exemplified in the petulant and hysterical tone in which the English newspapers, presumably voicing public opinion, discuss foreign inroads upon the domain of British trade. If the matter could be helped in any way by scolding about it this procedure would be less undignified than it is; as it cannot, the tone of current newspaper discussion only serves to emphasize the present embarrassments of British manufacturers and to call attention to the fact that they are by no means as formidable monopolists as they would have the world believe. The petulance to which we refer is not merely an instance of misdirected newspaper enterprise. We incline to think that the newspapers would let the subject discreetly alone if they were permitted to do so, but unless they keep it perpetually stirred up their readers flood them with letters urging editorial denunciation of unprincipled and inconsiderate foreigners who are poaching on British trade preserves, and demanding impossible Parliamentary interference of some sort for British protection. The latest and most acute grievance in this line grows out of the fact that England is not getting all the business of replacing the waste of war in South Africa, and that some of the contracts are coming to the United States, which has done nothing to help cause the vacuum. The subject has, as usual, been brought up in Parliament, and some very serious, though probably unfounded, accusations have been brought against Government officials in this connection. As to the fact that a great many South African orders have come to this country, there is no denying it; and the frightened British officials of Cape Colony, who have pleaded not guilty, have profited nothing thereby,

as those who charge them with indifference to British interests have published the list of American orders, and it is certainly long enough, and for merchandise of sufficient value, to make "mighty interesting reading" for all concerned. The cold facts have startled the vigilant guardians of British trade interests and set them clamoring with renewed energy. The *London Times* permits one of its writers, in discussing "the anti-British tendencies of some of the Cape officials," to characterize it as "disgraceful." Under these circumstances the Agent-General of the Cape Colony Government in London seems to have lost his temper in a perfectly natural and entirely justifiable manner. He gives the business methods of the British manufacturers a rap by explaining that the reason orders have gone to the United States was "because the goods were needed promptly and at reasonable prices," and could not have been had on these terms in England. He says: "As dispatch in the execution of orders and reliance on due dates of delivery cannot be always calculated upon in this country (England), the United States, which can accomplish both, have thereby occasionally secured contracts for railway material urgently needed. The Cape Government send their orders through an agency in New York whenever necessity demands it, and this necessity is urged by the desire for dispatch and economy." In the judgment of those who regard independence of thought or action on the part of colonial officials as "disgraceful," this is adding insult to injury. We believe it has been established more or less securely as a principle of law that "the greater the truth the greater the libel." It does not seem comprehensible to the people of England that in the discharge of their public duties the colonial officials have no opportunity for sentiment touching the pecuniary interests of the mother country, and that in their case patriotism and fidelity to duty demand that they shall purchase what they need in the market which offers the largest advantages. It is, after all, much better to be scolded in the London newspapers than to be condemned at home for official malfeasance. In point of fact, British manufacturers are temperamentally incapable of comprehending and meeting the emergencies which the war has created in the way of colonial necessities. There is a disconcerting suddenness and a disquieting exigency about their needs which the Englishman finds it difficult to understand and almost impossible to conform to. He likes to do business on established lines and in conformity with a regular and orderly method of habitual procedure. In this country we understand the colonial needs much better. Our own national development has been very largely the outgrowth of exigencies which have had to be met promptly. Orderly and habitual methods of procedure have no charms for us. The best thing to do is that which gives the best and most immediate results. The *London Times*, through its commissioner sent to the United States to study our system of shop organization and our business methods, gave at great length in the series of articles printed last summer the reason why we are better able to meet the exigent demands of colonial trade than the British manufacturers are. No doubt it hurts just as much to see orders coming to this country which it was expected would go to England as if the reason had not been given so fully and clearly. But "dispatch and economy" are considerations of very great weight in determining the direction of trade, and until conditions can be equalized in these respects we do not think the scheme of a Zollverein which shall unite England and her nominal colonies in a close commercial connection, to the exclusion of the rest of the world, which is again agitated, will have



much attraction for the colonies. The threat of the withdrawal of London co-operation in the financing of colonial undertakings is by no means as formidable as it was before New York became a financial center in which nothing which has the character of an attractive "banking proposition" need go begging.

Meanwhile the English manufacturer is getting a good many side lights on his lack of success in the competition for South African trade which he should find instructive. Whether he does or not is a question he alone can answer. For example: A correspondent of a leading English trade journal sends from South Africa the following suggestive and amusing letter: "I can give you another illustration of the way in which the indifference of the British manufacturer drives trade into foreign hands. I recently applied to a maker in London for quotation for some thousands of wooden boxes, specifying the size, and the nature and weight of the contents they were to carry. The British manufacturer asked for particulars as to the thickness of the wood and declined to quote without this information. While obtaining the necessary details from abroad, I at the same time sent the inquiry to America, and received a reply by return mail, quoting prices for boxes and estimated strength to carry the contents specified, although stating that the thickness should have been given. The result is that America will probably get the order. I see two rivals sitting side by side at a dinner table. The Yankee at once 'goes for' the repast and satisfies his needs. The Britisher finds himself short a knife or a spoon, calls for the missing article, and will not commence his meal until he gets it; and when at last it comes the dinner is all consumed. Surely the British manufacturer must be losing his appetite for trade."

It would be much more to the advantage of all in interest if the whole tone of English discussion of matters relating to foreign competition could be changed. Natural conditions—supplemented, it may be, by remediable causes—have deprived Great Britain of the advantage she enjoyed until a few years ago in nearly all lines of manufactures. This advantage can never be recovered, and it is by no means desirable that it should be. For her manufacturers to assume that they have a vested monopoly of any market is silly, and leads them to do a great many stupid things and say a great deal that is injurious to their own interests. Moreover, it does not bring them any more business or hold what they have. They are by no means proper objects of international sympathy. Their achievements have been wonderful, and the industrial and commercial history of Great Britain is something to be proud of. The English are, and will probably remain for a long time, the greatest nation of Europe from every point of view. Their trade is not disintegrating to a greater extent than economic changes necessitate—though perhaps it will if the English people do not show a greater facility of adaptation to modern business conditions. Their faith in the benefits of "wars of the yard stick" is almost mediæval. The results are to increase the burdens of the people and the responsibilities of government much faster than it opens new and profitable markets for British manufacturers. She has more than one formidable competitor to reckon with, and the more said about the handicap of habitual methods the greater the stimulus to effort in every country which is ambitious of industrial supremacy.

Statistics just published show that about 100,000 more immigrants were landed at the port of New York in 1900 than in the previous 12 months, the total entries being 403,491 in 1900 and 303,762 in 1899.

## CORRESPONDENCE.

### Spanish Engineers.

*To the Editor:* A very funny, yet, I believe, very typical, instance of the incomprehensibility of mechanical matters to the Spanish mind, has occurred to me.

Just after the close of the Civil War our European squadron was lying at Genoa and a Spanish merchantman came into port, with engines so deranged that fire as they would, about a mile an hour was all they could get out of her. The captain applied to Admiral Goldsborough to let a number of the engineers of the fleet come on board his ship and see what was the matter with the engines. Several did so and, safe to say, were never before so amused. The engines were of the annular compound type, the low pressure cylinder being outside the high pressure one, the low pressure cylinder being an annulus between the inside of one cylinder and the outside of the other. Now, the wise Spanish engineers had carefully packed the outside of the annular piston but had not put any packing in the inner side! Needless to say those engines "blew through" not a little, and Don Engineer was vastly astonished at a construction that required pistons packed in an inner circumference. The packing on the outside was comprehensible to him, but on the inside—! He could not do justice to that way of packing. Is it any wonder that we could sink two fleets of Spanish war vessels with the loss of only one man?

W.

## The Carnegie Steel Company Going Into Tubes.

In explanation of the extensive land purchases of the Carnegie Company, at Conneaut Harbor, Ohio, and the numerous reports of the company's intention to establish a manufacturing plant at that point, President Charles M. Schwab made clear the plans of the company with respect to these purchases.

Mr. Schwab states that for over a year the Carnegie Company have contemplated entering into lines of manufacture other than those in which they have been engaged hitherto, and the first step in carrying out this purpose is to be taken at once by the establishment of the largest pipe and tube manufacturing plant in the world at Conneaut Harbor, Ohio, which is the Lake Erie Terminal of the Carnegie-Pittsburgh, Bessemer & Lake Erie Railroad, 153 miles from Pittsburgh.

The company have purchased 5000 acres of land immediately east of the Conneaut Harbor Docks, and a large part of this tract will be utilized as a site for the tube works. It was the intention before the plans were commenced a year ago to locate the works upon the Monongahela River, but the enormous area of the proposed establishment made the original site impracticable.

Options upon land on the Allegheny Valley Railroad at Tarentum were then secured, with the view of locating the works there. However, investigation proved that the drawbacks of this site were too numerous and difficult to overcome. The Tarentum land required a railroad to be built in order to connect with the Bessemer Railroad, and to do this it was found that it would be necessary to move the tracks of the Allegheny Valley. The site is also comparatively small for the purpose intended, and left no ground for future additions.

With the works established at Conneaut, it is the expectation to rush the shipments during the navigable months, April to December, and thus reduce transportation charges to not over one-third or even one-fourth of the rates now charged for rail shipment. The Bessemer Railroad at present returns hundreds of empty cars daily to Conneaut, and with the works on the Lake Shore completed the road will have a back haul of coal and coke, the transportation of which will cost virtually nothing. It was desirable to utilize the full benefits of the Bessemer Railroad, and the shipment of coal and coke will balance the traffic to some extent. From Conneaut water communication is sure to New York, Boston and other Eastern ports via the Erie Canal—soon to be enlarged—and the Welland Canal; also the large cities on

the Great Lakes, including Chicago, Milwaukee, Cleveland, Buffalo and other points.

Lake Erie will furnish an abundant water supply for the tube works—a very important consideration in locating a plant of the size proposed. The works will stretch over a mile of the lake front, and it is the aim to make it the most extensive and complete plant of its kind in every branch ever built. It will include all essentials in the scale of pipe and tube manufacturing, from the ore to the finished product. The general system of operation will be continuous, the ore being unloaded from vessels at one end and worked through the successive stages of iron and steel making in a direct line to the finished pipe and tubing at the other end. Electric power will be principally employed for driving the machinery. The blast furnaces to be built will probably exceed in size and capacity the two great stacks now being finished by the Carnegie Company at Rankin. The investment exclusive of ground will reach about \$12,000,000.

(By Telegraph.)

PITTSBURGH, PA., January 9, 1901.—The determination of the Carnegie Steel Company to build a mammoth works at Conneaut for the manufacture of Pipes and Tubes is simply carrying out a policy outlined some time since, and means also that the Carnegie Company will take up other lines of Finished Material, announcement of which will likely be made before long. Details of the size of the Tube works to be built at Conneaut cannot be given, but in a general way it may be stated that it will be very much the largest plant in the world; in fact will be several times as large as any existing Tube plant. The initial works will consist of either two or four blast furnaces, the number not as yet having been decided upon, and these will be the largest ever built. Each furnace will be from 110 to 115 feet high, about 25 feet in diameter at the bosh and each will be able to turn out from 700 to 800 tons or more of metal per day. In fact, it is not improbable that these furnaces may each get up to 1000 tons per day. There will also be a Basic Open Hearth Steel plant to consist at first of 20 50-ton furnaces, and this number will likely be increased later on. There will also be a very large Blooming mill, Bell and Lap Weld furnaces, and in fact everything necessary to make a most complete plant. The motive power will be electricity. It is expected that the initial plant will have an annual capacity of 1,000,000 tons of Tubular goods. A great many details of the mammoth works remain to be worked out, but we may state that actual building will be commenced at the earliest date possible, and it is expected to have the works in operation within 12 or 15 months from the time ground is broken.

## PERSONAL.

Henry Phipps of Pittsburgh has purchased a large plot of ground at the northeast corner of Fifth avenue and Eighty-seventh street, New York, three blocks distant from the site on which Andrew Carnegie is building a residence.

Andrew Carnegie has agreed to give Seattle, Wash., \$200,000 for the building of a public library. He requires a yearly guarantee of \$50,000 for maintenance and improvements.

Edward J. Hamilton of Braddock has been appointed assistant to Joseph E. Schwab, general superintendent of the Duquesne Steel Works, Duquesne, Pa. Mr. Hamilton succeeds Wm. Richards, who resigned recently to take a position with the Dominion Iron & Steel Company at Sydney, Cape Breton, N. S.

Leo Bullion who has been superintendent of the Brownfield Works of the H. C. Frick Coke Company, has resigned to accept a position in the offices of the Carnegie Steel Company, at Pittsburgh. He has been succeeded at the Brownfield Works by S. Simpson, formerly store manager at Lensenring Works.

A number of the leading officials of the American Steel Hoop Company made a tour of the mills owned by that concern in the Youngstown district last week. Among those in the party were Chas. S. Guthrie, presi-

dent and chairman; Veryl Preston, vice-president; F. S. Wheeler, treasurer, and Frank L. Clark, manager.

Chas. B. Houston, of the firm of C. B. Houston & Co., has been elected to succeed George H. Stickney as president of the Tidewater Steel Company. At a meeting of the Board of Directors, held in the company's office in Philadelphia, President Stickney's resignation was received and accepted and Mr. Houston was unanimously elected to fill the position. Since the organization of the Tidewater Mr. Houston has been a member of the Board of Directors, and aside from that his ability to fill the position was recognized and the other members have had him under consideration for some time. That there will be some changes at the plant is not denied, but there has been no statement to that effect given out by the officials as public property.

G. F. Eldridge, late with C. R. Baird & Co., has accepted a position with B. Nicoll & Co., 59 and 61 Wall street, New York.

William Dette, late with C. R. Baird & Co., has accepted a position with J. K. Dimmick & Co., Drexel Building, Philadelphia.

Lincoln W. Gruber has retired from the firm of B. W. Cotton & Co., Philadelphia, Pa., and on January 1 assumed charge of the sales department of the Frankford Steel Company, Philadelphia.

Captain Francis T. Bowles, in charge of the Department of Construction and Repairs in the Navy Yard, Brooklyn, will succeed Rear Admiral Phillip Hichborn in charge of the Bureau of Construction and Repairs in Washington on March 4.

Walter Rachals, formerly assistant engineer at the Ohio works of the National Steel Company, at Youngstown, Ohio, has been appointed chief designing engineer of the company in succession to Marvin A. Meland, who has resigned in order to become general manager of Wm. A. Tod & Co., Youngstown, Ohio.

T. J. Hyman has been elected treasurer of the Illinois Steel Company to succeed Wm. H. Thompson, resigned. Mr. Hyman is now both secretary and treasurer. James P. Walker has been appointed assistant secretary, A. J. Singer, manager of credits and collections, and A. W. Carlisle, cashier.

B. F. Allen, formerly superintendent of the Harrisburg Foundry & Machine Works, Harrisburg, Pa., has been appointed mechanical engineer of the establishment. He is succeeded as superintendent by J. R. Matlack of New York.

Arthur Holland, representative in London, England, of the American Steel & Wire Company, was a visitor in Pittsburgh last week.

J. L. Greatsinger, for many years president and general manager of the Duluth & Iron Range Railroad, has been elected president of the Minnesota Iron Company to succeed D. H. Bacon, resigned.

R. H. Gilmour, for the past seven years superintendent of the Waterous Engine Works Company, Toronto, Canada, has resigned in order to accept a position with the Canadian General Electric Company in Toronto.

H. G. Merry who severed his connection as general manager and agent of the Low Moor Iron Company of Virginia on the 1st inst. will spend the winter in Florida and the West Indies.

The friends in this country of E. Windsor Richards of Caerleon, Mon., will be pleased to learn that the Queen Regent of Spain, on behalf of the King, has conferred upon him the high dignity of the Grand Cross of the Royal Order of Isabel the Catholic for eminent services given to the iron and steel industries of Spain. In May last Mr. Richards received the decoration of the Commander of the Order of Leopold from the King of Belgium.

Paul Goepel and Charles G. F. Wahle have formed a copartnership for the general practice of law and the conduct of litigation affecting letters patent, trade-marks and copyrights under the style of Goepel & Wahle, with offices in the Dun Building, New York.

Elmer E. Sperry, who has been electrical engineer of the Cleveland Machine Screw Company of Cleveland,



is acting in a similar capacity for the American Bicycle Company, who have taken over the automobile business of the former company.

### The Rock Island Arsenal Bids.

WASHINGTON, D. C., January 8, 1901.—The officials of the Ordnance Bureau of the War Department are making special efforts to settle a number of controversies that have arisen as an outcome of the opening of a series of bids for machine tools for the Rock Island Arsenal some weeks ago. The schedules were very elaborate and it required considerable time to arrange them so as to permit of careful comparison. Major Blunt, commandant of the Rock Island Arsenal, then proceeded to make recommendations to the Department as to the acceptance of certain bids, and finally forwarded all the papers to the Department at Washington. A number of prominent manufacturers have since learned that Major Blunt's recommendations have not followed the lowest bids, even in the case of thoroughly tested machinery of standard patterns, and protests have therefore been filed against the awarding of contracts in accordance with the recommendations. The ordnance officials have called on Major Blunt for a special report, setting forth his reasons for recommending the awarding of contracts to others than the lowest bidders, and it is expected that he will be heard from within a few days. Should there be any further difficulty in making the awards, it is stated at the Department that contracts will be promptly let for all the undisputed items, leaving those in controversy to be determined later.

W. L. C.

**The Standard Seamless Tube Company.**—The National Tube Company of Pittsburgh have purchased a controlling interest in the stock of the Standard Seamless Tube Company, with works at Ellwood City, Pa., and a reorganization of the latter concern has been made. Frank J. Hearne, first vice-president of the National Tube Company, has been made president of the Standard Seamless Tube Company, and Wm. H. Latshaw, third vice-president of National Tube Company, has been made secretary and treasurer of the Standard concern. The mercantile affairs of the Standard Seamless Tube Company will be in the hands of J. H. Nicholson, and the offices have been removed from 421 Wood street to Conestoga Building, Pittsburgh. The acquisition of the property of the Standard Seamless Tube Company by National Tube Company, in connection with their United States seamless department, at Christy Park, near McKeesport, Pa., gives this concern greater facilities for the manufacture of seamless tubing, permitting them to make all sizes from ½ inch to 16 inches outside diameter, and of any practical gauge. We may state that the plant of the Standard Seamless Tube Company is one of the best equipped plants in the country for the manufacture of seamless tubing. An item of interest in this connection is that before this plant was finished they took a contract from the United States Government for 55,000 seamless tubes, and filled it within 90 days, the quality of the tubing giving entire satisfaction. The sizes turned out at the Ellwood City plant have been mainly from ½ inch up to 4 inches, while in the Christy Park works the largest sizes have been made, thus giving the National Tube Company facilities for turning out a complete range of sizes. It is probable that the capacity of the Ellwood City works will be materially increased.

**Prosperous Connecticut Industries.**—The annual report of the Connecticut Bureau of Labor Statistics for the year ended November 30, 1900, shows a year of marked industrial prosperity in the State. As compared with the previous year, wages paid in 514 establishments rose from \$35,553,357 to \$38,695,646, and rose in every branch except rubber and silver goods and shoes. The gross value of the goods produced in 712 establishments was \$209,396,534, of which \$49,178,587 went in wages. The pay of wage earners averaged \$1.52 a day. The highest relative increase in amount paid for wages was in wire and wire goods, 28.8 per cent. In value of Connecticut manufactured products brass goods lead with

\$60,749,035, followed by machinery, \$19,608,182; rubber goods, \$18,994,472; general hardware, \$12,642,956; woollens, \$12,487,585, and silk goods, \$11,652,211. For the first time the bureau presents tabulated ratios giving the percentage of the labor cost in the value of manufactured products of the State. The general average is 23.5 per cent., varying from 11.9 per cent. in leather goods to 42.5 per cent. in cutlery and tools.

**The Springfield Boiler Works.**—The Springfield Boiler & Mfg. Company, Springfield, Ill., report through Granville Kimball, their Western representative, Marquette Building, Chicago, that on account of the heavy increase in their business they have been obliged to erect a large foundry and machine shop, 65 x 281 feet, and to equip all their machine tools with motors for more rapid work. They have installed many new tools, including a Niles special heavy flanging machine and a 20-ton electric crane. They have acquired the exclusive rights, patents and drawing of the Campbell & Zell water tube boilers, Baltimore, Md. J. Virden Campbell, president of the old Baltimore company, is now Eastern representative of the Springfield Boiler & Mfg. Company, with offices at Baltimore. The Springfield Company have put on a night force. Their 1900 business was fully 150 per cent. increase over 1899. Besides many small orders on hand, they have just closed boiler contracts with the following parties: Wm. F. Grower, Chicago, three 125 horse-power; Chas. G. Gunther, Chicago, two 150 horse-power; Illinois Zinc Company, Peru, Ill., one 200 horse-power; Bloomington Electric Light & Power Company, Bloomington, Ill., three 250 horse-power; Capital City Electric Company, Springfield, Ill., two 250 horse-power. All these are internally fired boilers. Other boiler contracts are as follows: Union Pacific Railroad Company, Cheyenne, Wyo., five 200 horse-power; Montana Ore Purchasing Company, Butte, Mont., two 250 horse-power, internally fired, fitted with Morrison corrugated furnaces.

**The Harbison-Walker Company.**—The stockholders of the Harbison-Walker Company, fire brick manufacturers, Park Building, Pittsburgh, have purchased all of the stock of the W. H. Hawes Fire Brick Company. The plant is located at Mount Union and manufactures silica brick exclusively. S. C. Walker has been elected president, succeeding Scott Dibert; B. C. Youngman, secretary, and Wm. Walker, treasurer, succeeding John H. Waters. The main office of the company has been removed from Johnstown, Pa., to room 1405, Park Building, Pittsburgh. The Harbison-Walker Company own the greater portion of the Ganister Rock for several miles surrounding Mount Union, and will increase and add improvements to the plant.

**The Firth-Sterling Steel Company.**—The Firth-Sterling Steel Company of Pittsburgh have determined on making some extensions to their works at Demmler which will very considerably enlarge their product. They have acquired land adjoining their present site and the building will be commenced at once. The company have not been able to keep pace with their rapidly growing business with their present facilities, and they are forced to put up a new plant to enable them to take care of it. The extensions will consist of new melting furnaces, hammers and mills, and there will be an entire rearrangement of the works, which will enable them to reduce their costs of manufacture very considerably.

**Cold Rolled and Cold Drawn Shafting.**—At a meeting of the manufacturers of cold rolled and cold drawn shafting, held in New York City on Friday, January 4, the discounts for cold rolled and cold drawn shafting were shortened from 52 and 57 per cent. to 55 per cent. off in carloads and 50 per cent. off in less than carloads, delivered in base territory, being an advance in the net price of .10 cent per pound.

**The Valley Furnace Scale.**—The basis of the new scale for blast furnace labor in the Mahoning and Shenango Valleys is \$1.65 a day for bottom fillers. The new scale does not take effect until February 1.



## Pig Iron Production Sharply Increasing.

### Stocks Continue to Decline.

There has been a very considerable addition to the capacity of the furnaces in blast during the month of December, a part of it being due to the starting of plants connected with rail makers. Some preparations are going on to start additional stacks, but for the present the vigor of the movement is slackening.

Stocks in the hands of merchant furnaces have declined somewhat. It should be noted, however, that this is not general, a disposition to accumulate iron having developed in some leading districts.

The weekly capacity of the furnaces in blast on January 1 compares as follows with that of the preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
January 1, 1901	233	250,351
December 1, 1900	211	228,846
November 1	301	215,904
October 1	213	223,169
September 1	228	231,778
August 1	240	244,426
July 1	284	283,413
June 1	293	296,376
May 1	292	293,850
April 1	291	289,482
March 1	293	292,643
February 1	296	298,014
January 1, 1899	280	294,186
December 1, 1899	283	296,959
November 1	277	288,522
October 1	265	278,650
September 1	257	267,335
August 1	244	267,672
July 1	237	263,363
June 1	220	251,062
May 1	217	250,095
April 1	205	245,746
March 1	192	228,195
February 1	195	237,639
January 1, 1898	200	243,516
December 1, 1898	195	235,528
November 1	196	228,935
October 1	192	215,635
September 1	186	213,043
August 1	187	206,777
July 1	185	216,311

The condition of the coke and anthracite furnaces at the beginning of the month was as follows:

### Coke and Anthracite Furnaces in Blast January 1, 1901.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New York	14	2	3,059	12	8,867
New Jersey	8	2	1,321	6	3,281
Spiegel	3	3	585	0	0
Pennsylvania:					
Lehigh Valley	29	16	9,820	13	5,064
Spiegel	1	1	111	0	0
Schuylkill Valley	14	9	8,182	5	2,115
Upper Susquehanna	4	3	3,567	1	336
Lower Susquehanna	9	3	3,670	6	2,586
Spiegel	1	1	510	0	0
Lebanon Valley	13	10	8,923	3	2,360
Pittsburgh District	36	26	57,860	4	6,486
Spiegel	1	1	1,115	0	0
Shenango Valley	15	8	12,229	7	6,608
Western Pennsylvania	22	10	14,495	12	74,98
Spiegel	1	1	487	0	0
Maryland	5	3	5,712	2	1,375
Wheeling District	8	5	7,714	3	4,095
Ohio:					
Mahoning Valley	14	9	19,392	5	
Central and Northern	14	10	15,075	4	
Hocking Valley	2	2	809	0	0
Hanging Rock	14	7	3,554	7	2,800
Illinois	16	12	23,340	4	4,549
Spiegel	1	1	860	0	0
Minnesota	1	0	0	1	763
Wisconsin	5	3	3,557	2	1,176
Missouri	1	0	0	1	570
Colorado	2	2	2,008	0	0
The South:					
Virginia	20	16	9,299	4	2,260
Kentucky	5	2	667	3	1,720
Alabama	28	25	19,585	13	7,934
Tennessee	14	8	5,748	6	2,827
Georgia	1	0	0	1	450
North Carolina	2	0	0	2	437
Totals	328	301	243,254	127	91,496

In comparison with previous months the record of the coke and anthracite furnaces stands as follows in gross tons:

	Number in blast.	Capacity per week.
January 1, 1901	301	243,254
December 1, 1900	179	222,067
November 1	171	207,381
October 1	182	214,921
September 1	197	223,551
August 1	209	236,131
July 1	252	274,921
June 1	266	288,771
May 1	267	286,956
April 1	262	281,644
March 1	264	285,596
February 1	264	290,010
January 1, 1899	250	286,729
December 1, 1899	253	289,448
November 1	248	281,409
October 1	241	272,428
September 1	233	261,670
August 1	222	261,485
July 1	217	257,345
June 1	204	249,119
May 1	197	245,249
April 1	188	240,969
March 1	175	223,865
February 1	178	232,672
January 1, 1898	180	237,490
December 1, 1898	177	229,510
November 1	176	222,988
October 1	172	209,903
September 1	165	206,750

During December the following furnaces were started: Wharton in New Jersey, Topton in the Schuylkill Valley, one Allentown Rolling Mill, one Edgar Thomson in Pittsburgh, Sharon in the Shenango Valley, Saxton in Western Pennsylvania, two Bird Coleman, two Colebrook and North Cornwall in the Lebanon Valley, one Crozer in Virginia, Newburgh in the Cleveland district, Lawrence and Milton in the Hanging Rock region, one Union in Chicago, one Bay View in Wisconsin, Seneca and Tod in the Mahoning Valley, one Alice in Alabama and one Dayton in Tennessee.

### Charcoal Furnaces in Blast January 1, 1901.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New England	7	3	285	4	360
New York	2	2	194	0	0
Pennsylvania	13	11	123	11	500
Maryland	4	1	102	3	340
Virginia	3	1	103	1	80
Ohio	6	3	310	3	80
Kentucky	3	0	0	3	200
Tennessee	5	2	1,168	3	320
Georgia	4	2	585	2	350
Alabama	4	3	1,014	1	325
Michigan, Missouri and Wisconsin	13	8	3,293	5	2,395
Texas	4	1	120	3	775
Totals	68	32	7,067	36	5,705

As compared with previous months the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
January 1, 1901	32	7,067
December 1, 1900	32	6,779
November 1	30	7,923
October 1	31	8,248
September 1	31	8,227
August 1	31	8,295
July 1	32	8,492
June 1	27	7,605
May 1	25	6,894
April 1	29	7,838
March 1	29	7,047
February 1	32	8,004
January 1, 1899	30	7,457
December 1, 1899	30	7,511
November 1	29	7,113
October 1	25	6,222
September 1	24	5,665
August 1	22	6,189
July 1	20	6,018
June 1	16	4,943
May 1	20	4,846
April 1	17	4,777
March 1	16	4,330
February 1	17	4,967
January 1, 1898	20	6,026
December 1, 1898	18	6,018
November 1	20	5,947
October 1	20	5,732

### Furnace Stocks.

The position of furnace stocks, sold and unsold, as reported to us, was as below on January 1, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron.

Stocks.	Aug. 1.	Sept. 1.	Oct. 1.	Nov. 1.	Dec. 1.	Jan. 1.
Anthracite and Coke	460,824	373,713	608,587	573,932	493,702	479,450
Charcoal	43,517	49,444	61,944	67,514	62,934	69,213
Totals	504,341	423,157	670,531	641,466	556,636	548,663

**Warrant Stocks.**

The American Pig Iron Storage Warrant Company report the following stocks:

Stocks.	Aug. 1.	Sept. 1.	Oct. 1.	Nov. 1	Dec. 1.	Jan. 1.
Coke and Anthracite.....	12,000	20,000	20,300	18,500	17,400	15,000
Charcoal.....	1,800	1,800	1,500	1,500	1,400	1,400
Totals.....	13,800	21,800	21,800	20,000	18,800	16,400

**MANUFACTURING.****Iron and Steel.**

At the Sharon Works of the National Steel Company, Sharon, Pa., a slight reduction, averaging less than 5 per cent., on tonnage men has been made. The scale for cranimen has not yet been settled, but no trouble is anticipated, as only six or eight of them are employed at this plant. In regard to the report that a labor union was being formed at the Sharon works, we may state that the National Steel Company do not recognize labor unions, and none is being organized at these works.

We can state officially that it is not the intention of the American Tin Plate Company of New York City to remove the Star and Monongahela Mills in the Pittsburgh district, or Pennsylvania or Pittsburgh mills at New Kensington, Pa. All reports that any of these plants are to be removed are untrue.

The report that the American Steel & Wire Company, at Pittsburgh, had recently bought more ground on Neville Island, is untrue. This company have bought no land on Neville Island for the past five months, and there is no arrangement on at the present time for the purchase of any additional property there.

The National Tube Company of Pittsburgh are razing some tenement houses on property they recently acquired at McKeesport. These buildings are highly combustible and of no special value, and are being removed on that account. Just what future extensions of the National Works may be made to occupy this ground has not been determined.

Talledega Furnace, at Talledega, Ala., is to go into blast on February 1.

The Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio, will increase their capital stock from \$600,000 to \$1,000,000. Fifty per cent. of the increase will be taken by the original stockholders, and other Youngstown capitalists will take the remaining \$200,000.

The Firth-Sterling Steel Company of Pittsburgh, with works at Demmler, Pa., are preparing plans for large additions to their plant. The concern are manufacturers of projectiles and will considerably enlarge this department, and will also take up the manufacture of crucible tool steel. The company propose to engage in the making of steel on a very large scale.

A meeting of the stockholders of the National Roofing & Corrugating Company was held in Wheeling, W. Va., on Friday, January 4. The following directors were elected: G. E. Needham, Cleveland; R. T. Scott, Cambridge, Ohio; F. J. Hyndman, Cincinnati; F. C. Robbins, Niles, Ohio; C. F. Clark, Canton, Ohio, and F. G. Caldwell, of Wheeling. The main office of this concern will be at Wheeling.

An independent tin plate plant is to be built at Atlanta, Ind., by a company having Dr. Henry C. Uts as president. It is to be a six-mill plant. The equipment is reported to have been recently purchased at Youngstown, Ohio.

The Claire Furnace Company of Sharpsville, Pa., will make application for a charter on January 25. The incorporators are A. M. Robbins of Cleveland, A. W. Thompson, Louis T. Kurtz, William S. Foltz of New Castle, L. J. Robbins of Sharon. The concern will operate Claire Furnace at Sharpsville.

The Western Iron & Steel Company, Lakeview, Wash., are adding 30 x 60 feet to the main building of their rolling mill plant. The works have run steadily during the past year.

The Palmer Iron & Steel Company, at a recent meeting of the stockholders held in their Chicago office, changed their name to the American Rolling Mill Company, the change going into effect January 1. J. H. Palmer was re-elected president, and W. I. Moody was re-elected secretary and treasurer. The company's rolling mill is at Muncie, Ind.

The Republic Iron & Steel Company will build a mill at their Brown-Bonnell Works, Youngstown, for the rolling of hoops. It will have a capacity of from 100 to 150 tons a day. The small billets will be made in the new Bessemer plant at the Brown-Bonnell Works.

The Pittsburgh Works of the American Tin Plate Company, at New Kensington, Pa., which have been idle for some months have been started up.

The lease held by the Continental Iron Company on the Valley bar mill at Sharon, Pa., expired on January 1, and the stock is being removed to the Wheatland Mill, at Wheatland, Pa., which will be started about January 15.

Niles Iron & Sheet Company, which concern propose to erect a sheet plant at Niles, Ohio, have increased their capital

stock from \$100,000 to \$200,000. James Patterson is president and W. A. Thomas, secretary.

The Diamond State Steel Company of Wilmington, Del., have called additional capital, chiefly to build additional finishing mills.

The Beck & Corbitt Iron Company, St. Louis, have purchased the complete stock of the Globe File & Iron Company, St. Louis. We are advised that the officers of the latter company will be added to the official board of the Beck & Corbitt Iron Company, thus making the transaction practically a consolidation.

The Republic Iron & Steel Company blew in their Pioneer Furnace No. 2, Birmingham, Ala., on the 25th ult. Their Pioneer Furnace No. 1 was blown out on January 3.

The Allentown Rolling Mill Company, Allentown, Pa., started one of their furnaces January 1.

The Stanhope Furnace of the Musconetcong Iron Works, Stanhope, N. J., was banked for repairs December 18.

The Chattanooga Furnace Company, Chattanooga, Tenn., blew out their furnace the first of last month for the purpose of relining and building three Whitwell stoves. It is expected that the furnace will be ready to blow in again on April 1, 1901.

Jenifer Furnace, at Jenifer, Ala., is to be repaired previous to going into blast as a coke furnace. Formerly it produced charcoal iron.

Sheridan Furnace No. 1, at Sheridan, Pa., is to go into blast soon.

**Machinery.**

The American Emery Wheel Works of Providence, R. I., have added a department for the manufacture of vitrified emery wheels. The plant is now in operation.

The Cleveland Machine Screw Company, Cleveland, have abandoned the manufacture of electric automobiles, this department of their business having been turned over to the American Bicycle Company. The manufacture of vehicles will be continued at the Indianapolis plant of the latter company and all the equipment of the Cleveland Machine Screw Company's automobile department is being removed to that city. The manufacture of Sperry batteries will be continued at the Cleveland plant of the bicycle company. The Cleveland Machine Screw Company will in the future confine themselves exclusively to the manufacture of screw machines and the plant will be enlarged by the occupation of the factory erected some time ago for the manufacture of automobiles. They will shortly announce a new line of automatic machine tools of a different character from any which they have previously built.

The American Foundry Company, Rockford, Ill., who were organized last summer, made their first casting December 22. The company have built an entirely new and up to date plant for the manufacture of light gray iron castings, consisting of a main room, 275 x 50 feet; cupola rooms, 60 x 35 feet; core room, 30 x 40 feet; bath room, 25 x 30 feet; machine room, 60 x 40 feet; pattern room, 60 x 40 feet, and storage vault 32 x 20 feet. A number of Adams machines have been installed for machine moldings, and the foundry is able to handle the largest contracts in all grades of work.

A. D. Reynolds, Bristol, Tenn., is building a new foundry and machine shop which will have a smelting capacity of about 25 tons per day, and will manufacture largely cooking and heating stoves. The machinery and patterns of two plants are in hand and very little new machinery will be needed.

A. P. Carroll and J. P. Goodwin, Salem, Mass., have formed a co-partnership and began business January 1 as general machinists under the name of Carroll & Goodwin.

The International Power Company, 253 Broadway, New York City, are examining sites in the vicinity of this city for a large plant to meet the European demand for American built locomotives. The company now own the Providence Locomotive Works, and the Corliss Engine Works at Providence, R. I., and the American-Wheelock Engine Company of Worcester, Mass., and intend doubling the capacity of these plants. They inform us that there is a probability of their purchasing the Rogers Works at Paterson, N. J.

The Dawson Mfg. Company, Basic, Va., have purchased the plant formerly occupied by the Basic City Car Works Company. New lathes and other iron working machinery will be installed, and the plant will be otherwise improved for the manufacture of auto and locomobiles.

The Steel Tired Wheel Company, 71 Broadway, New York City, are building a \$25,000 power house and machine shop at Denver, Col. The company have factories at Chicago and other points in the East, and are constructing their new plant to supply their trade in trans-Missouri territory.

Walker & Elliott, Wilmington, Del., builders of mill machinery, have sold two large crushers to the Keene Cement Company, Glade Springs, Va.; a grinding mill for phosphate rock to the Lancaster Chemical Company, and have fitted out the Rocky Mountain Oil & Fertilizer Works and the Wilson Oil Company, both of North Carolina, with complete dry mixing



plants. They have also built a large fertilizer manufacturing plant for Armour & Co., at Baltimore.

The Nazareth Foundry & Machine Company, Nazareth, Pa., have organized with a capital stock of \$15,000. G. A. Schnubell, J. A. Miller, M. T. Schwartz, J. J. Helntzelman, and Conrad Miller are the incorporators. A site has been secured and a large building will shortly be erected. The company purpose to go into the manufacture of machinery quite extensively.

The Excelsior Machine Company, Cohoes, N. Y., have incorporated, with a capital stock of \$16,000. Leroy Vermilyea, J. H. Mary and J. A. Buck are the directors. The company have rented a factory and are to manufacture potato diggers.

The Chandler & Taylor Company, Indianapolis, Ind., have commenced the erection of their new shops on ground purchased a few months ago west of the city, consisting of 22 acres. The first building to be erected is for a foundry and is 275 feet long by 120 feet wide. Near by will be another building of the same dimensions, to be used as a boiler shop. The first building is to be completed by February 1, and the second by March 1. For the present their building on West Washington street, now occupied, will be utilized as a machine shop, but next season a large machine shop will be built on the ground west of the river. The buildings are to be constructed of brick resting on a stone foundation.

As already noted in these columns, the Carnegie Steel Company of Pittsburgh have sent out blue prints and inquiries for ten blowing engines and desire bids on same. So far none of these have been placed, despite reports to the contrary.

Geo. W. Wilson, director of Department of Public Works, Pittsburgh, will advertise in a few days for bids for two pair of engines for the Brilliant pumping station. The engines now in the station have a capacity of about 50,000,000 gallons a day, but this is not sufficient. The two pair of new engines will have a total capacity of about 25,000,000 gallons a day. Director Wilson has advertised for bids for these engines several times before, but the estimates submitted have been too high and could not be accepted.

The Graton & Knight Mfg. Company, Chicago, manufacturers of belts, are about to move into their new quarters, which are being fitted up for them at 54 to 56 South Canal street. The increase in business necessitated the removal. The company have secured many orders and contracts for supplying machinery companies in Illinois and Ohio. Gideon Kellogg, formerly of the Kellogg & Macauley Company, Chicago, is now superintendent of their sales department.

The Inter Ocean Company, Chicago, have let the following contracts for their new building: For two tandem compound engines, 150 and 300 horse-power, the Phoenix Iron Works, Western Union Building, Chicago; plumbing and sewerage, J. J. Wade & Son., Chicago; heating and steam piping, L. H. Prentice & Co., Chicago; two 400 horse-power boilers, water tube, and a Cahall style, to E. E. Darley, the Rookery, Chicago. Western representative of Aultman & Taylor; for the structural steel and iron work, Vierling, McDowell & Co., Chicago.

Greenlee Brothers & Co., Chicago, manufacturers of wood-working machinery, have recently improved the equipment of their machine shops and have added a full line of all kinds of auger bits to their products. They report that their foreign trade is increasing excellently. While 1900 has been one of the best years in their history, 1901 promises to equally as good.

The Hassell Iron Works Company, Colorado Springs, Col., who have heretofore been operating a foundry, will engage in the manufacture of heavy mining machinery, and will also open a general machinery store. F. A. Rider, formerly of the Bass Foundry & Machine Company, Fort Wayne, Ind., has been admitted a member of the firm, and will have charge of the engine and boiler department.

The Thibodaux Boiler Works, owned by Ozeme Naquin, Thibodaux, La., and the Thibodaux Sheet Metal Works, owned by L. Breaud & Co., also of Thibodaux, have consolidated and formed a stock company under the name of the Thibodaux Boiler Works, Limited, incorporated with a capital of \$10,000. The officers of the concern are, A. Naquin, president and treasurer; L. Breaud, vice-president; Joseph Breaud, general manager, and Joseph Naquin, secretary.

Among recently licensed corporations in Illinois are the Hanson & Tunellus Machine Company, Chicago, incorporated with a capital of \$10,000 to manufacture machinery, tools, &c. The incorporators are Chas. M. Hanson, Charles T. Tunellus and C. O. Hanson.

Wickes Brothers, Marquette Building, Chicago, are installing 12 vertical water tube boilers, with an aggregate horse-power of 4500, in the Armour & Company's new central power plant, at the Chicago Stock Yards.

The F. M. Underwood Gas Engine & Motor Company have removed their plant from Sandusky to Elmore, Ohio. The business men's association of the latter city gave the company a bonus of \$5000 and rent free for a year of the building formerly occupied by the Elmore Bicycle Company. Their new factory will be fully equipped and in operation by January 12, and they will be ready to attend to all inquiries and orders for stationary, marine and automobile motors.

The Modern Machinery & Electrical Company, Denver, Col., have organized to take over the business of the Coal Machinery Company. The company are the agents for The Northern Electrical Mfg. Company, Madison, Wis., and the Stanley Electrical Company, Pittsfield, Mass., and make an exclusive specialty of coal machinery.

The Nashville Machine Company, Nashville, Tenn., are building a brick shed with a metal roof in which to store bar iron.

The Buckeye Engine Company, Marquette Building, Chicago, have just closed a contract with the Muscatine Electric Company, Muscatine, Iowa, for a 600 horse-power engine. They are shipping an 1800 horse-power engine to the Illinois Steel Company, South Chicago, and a 1000 horse-power engine to the Chicago & Alton Railroad shops, Bloomington, Ill.

Kroeschell Brothers, boiler manufacturers, Kingsbury and Erie streets, Chicago, are just moving into their new addition. This consists of a machine and boiler shop, 50 x 200 feet, which will increase the capacity of the plant 100 per cent. Business is steadily increasing, and the firm contemplate many improvements to enable them to meet the demands of their customers. They have just completed the installation of all the boilers and auxiliary apparatus for the McCormick Harvesting Machine Company's power plant and twine mill.

The M. C. Bullock Mfg. Company, Chicago, say that the year just closed has been one of the very busiest in their history. They have built more heavy machinery for the various mining districts of the United States and Canada than during a similar period for many years, and their diamond prospecting and rock drills have been exported to nearly every country on the globe. They have just shipped a second diamond core drill to the Government of Nova Scotia, and have received the order for a second one from the Government of Chile. They have added more efficient equipment to their works during the past year and have put in a new electric lighting plant. They have orders booked for several months ahead. Their diamond drills were awarded a gold medal at the Paris Exposition, being the only diamond drills to receive an award. The outlook is fair for a still more prosperous year.

The Hunt Air Brake Company of New Kensington, Pa., are erecting a new building, 60 x 100 feet, to be used as a foundry department. Plans for other additions to this plant have been prepared and will be used for the manufacture of small ice machines to be attached to refrigerators.

Wm. Tod & Co., engine builders, Youngstown, Ohio, have increased their capital stock from \$300,000 to \$600,000.

The Dudley-Carper Mfg. Company, 1211 Pine street, St. Louis, Mo., have been incorporated to succeed A. W. Dudley & Co. This concern do general machine shop work and manufacture specialties. Their original plant was well equipped, but in addition thereto they have recently bought the outfit of the former New Hietts Machine Company.

The Pawtucket Foundry Company's new foundry in Pawtucket, R. I., is rapidly nearing completion. The two-story board building, 50 x 60 feet brick, is finished and the brick work on the molding room, 60 x 20 feet, is about done. The plant will be under the management of F. A. Thomas.

The McAleenan Boiler Company, Peoria, Ill., are building a new factory. The size of the building is 103 x 214 feet, running on the C., B. & Q Railroad track. The engine room is 40 x 50 feet.

John C. Boyd, Bangor, Maine, has taken R. H. Hitchcock into partnership, and the general machine business carried on by Mr. Boyd for several years is now being conducted by the new firm, John C. Boyd & Co.

Kane & Roach, Syracuse, N. Y., manufacturers of machinery, are running their plant night and day, and last week an additional force was engaged. The work of enlarging the plant has just been completed. They report that October and November were the two busiest months in the history of the concern. A number of large orders are booked ahead, and they are receiving more inquiries than before in many months.

The Ash & Harper Company, Lansing, Mich., who recently organized, have rented a plant completely equipped for the manufacture of marine and stationary gas engines. The company are looking around for a site upon which to erect a factory, and expect a bonus from the town in which they locate.

The Wheland Machine Works, Chattanooga, Tenn., manufacturers of saw mill machinery and engines, have incorporated, with a capital stock of \$100,000. G. W. Wheland, Z. W. Wheland, E. F. Wheland, L. B. Wheland, R. F. Calloway and A. W. Nagle are the organizers. The business formerly conducted by G. W. Wheland, under the style of Wheland's Machine Works, passes into the hands of the new company, who intend adding some new equipment, and expect in the near future to erect additional buildings.

The American Steam Pump Company, Battle Creek, Mich., stamp as erroneous the report that they intend building a new foundry. The fact is the company already have a thoroughly equipped and up to date foundry.

The Cleveland Punch & Shear Works, Cleveland, have taken contracts for a large bending and straightening machine, and a 50-foot planer for the Meehan Boiler & Construction Company, Lowellville, Ohio.



## The Iron and Metal Trades.

The monthly blast furnace statistics show that we entered the new year with a considerable increase in the active capacity. The furnaces were producing at the rate of a little over 250,000 tons per week as compared with 229,000 tons on December 1, 1900, and 294,000 tons on January 1, 1900. Furnace stocks of all kinds of Iron were down to about 550,000 tons on January 1, as compared with 557,000 tons on December 1 and 670,000 tons on October 1, 1900.

As yet the increase in the product has not run its course, since a number of furnaces have started since the opening of the year and others are to follow. It looks, therefore, as though in the near future production may slightly overbalance the consumption. In fact, in some important districts there has been a slight increase in the stocks.

Aside from some large sales of Basic Pig and of lower Foundry grades to Pipe makers in the Philadelphia district, no markedly important transactions have taken place in Pig Iron.

The Steel Billet makers had a meeting during the past week, but did not touch prices. Reports from Europe indicate the decline which has taken place there. German Steel is being offered at £4 2s., f.o.b. Rotterdam, and correspondingly low prices are quoted in England. It is figured roughly that with a \$5 through rate from Pittsburgh to Great Britain it would be difficult to net more than about \$16.50, Pittsburgh, for export orders.

Aside from the report that the Fort Wayne Bridge, at Pittsburgh, calling for about 10,000 tons, has been closed, no large transactions have taken place in Structural Material. There is some talk of very extensive track elevation in Philadelphia, which ought to bring out a large tonnage.

The Plate mills continue crowded. An interesting indication of the situation is furnished by the fact that a Chicago mill has taken an order for 4500 tons of Plates for tidewater delivery.

A sensation has been created by the announcement that the Carnegie Steel Company are to build a large plant at Conneaut, on Lake Erie, for the manufacture of Merchant Pipe. This is said to be merely the forerunner of similar undertakings in other directions. Since it is proposed to produce the Steel from the Ore up, it does not affect the question of securing an outlet for surplus Steel tonnage in the Pittsburgh district. In fact, it is positively asserted that relief there is to be sought by the building of a large Sheet mill.

In the trade the move of the leading Pittsburgh producer to the Lake is regarded as a significant recognition of the advantages of Lake locality.

The project furthermore shows how insecure is the claim to even an approach to monopoly claimed for some of the large consolidations. Recently the indications have been multiplying that the disturbance of old relations between the old seller of the semi-finished material and the buyer, transformed into a consolidation, may strain old relations and cause preparations to invade territory formerly respected. It looks as though the battle of the giants may develop sooner than expected. The current year will probably merely be one of preparation.

## A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type.  
Declines in Italics.

	Jan. 9, 1901.	Jan. 2, 1901.	Dec. 12, 1900.	Jan. 10, 1900.
<b>PIG IRON:</b>				
Foundry Pig, No. 2, Standard, Philadelphia.....	\$15.50	\$15.50	\$15.75	\$23.00
Foundry Pig, No. 2, Southern, Cincinnati.....	13.75	13.75	13.75	20.25
Foundry Pig, No. 2, Local, Chicago.....	15.00	15.00	14.50	23.50
Bessemer Pig, Pittsburgh.....	13.00	13.25	13.50	21.90
Gray Forge, Pittsburgh.....	13.15	13.25	13.25	21.25
Lake Superior Charcoal, Chicago....	19.50	19.50	19.50	25.50
<b>BILLETS, RAILS, ETC.:</b>				
Steel Billets, Pittsburgh.....	19.75	19.75	19.75	35.00
Steel Billets, Philadelphia.....	21.00	21.00	21.00	37.50
Steel Billets, Chicago.....	20.75	20.75	20.75	38.00
Wire Rods (delivered).....	35.00		33.00	nom.
Steel Rails, Heavy, Eastern Mill.....	26.00	26.00	26.00	35.00
Spikes, Tidewater.....	1.50	1.50	1.50	2.65
Splice Bars, Tidewater.....	1.35	1.35	1.35	2.30
<b>OLD MATERIAL:</b>				
O. Steel Rails, Chicago.....	10.00	11.00	11.00	18.00
O. Steel Rails, Philadelphia.....	15.00	16.00	16.00	30.00
O. Iron Rails, Chicago.....	15.00	17.50	17.50	35.00
O. Iron Rails, Philadelphia.....	18.00	18.00	17.50	36.00
O. Car Wheels, Chicago.....	11.50	15.50	15.50	21.00
O. Car Wheels, Philadelphia.....	17.00	17.00	17.00	20.50
Heavy Steel Scrap, Chicago.....	11.00	11.00	11.00	18.00
<b>FINISHED IRON AND STEEL:</b>				
Refined Iron Bars, Philadelphia.....	1.45	1.45	1.45	2.20
Common Iron Bars, Chicago.....	1.45	1.45	1.45	2.30
Common Iron Bars, Youngstown.....	1.30	1.30	1.30	2.15
Steel Bars, Tidewater.....	1.40	1.40	1.40	2.40
Steel Bars, Pittsburgh.....	1.25	1.25	1.25	2.25
Tank Plates, Tidewater.....	1.55	1.55	1.58	2.40
Tank Plates, Pittsburgh.....	1.40	1.40	1.40	2.25
Beams, Tidewater.....	1.65	1.65	1.65	2.40
Beams, Pittsburgh.....	1.50	1.50	1.50	2.25
Angles, Tidewater.....	1.55	1.55	1.55	2.40
Angles, Pittsburgh.....	1.40	1.40	1.40	2.25
Skelp, Grooved Iron, Pittsburgh.....	1.50	1.50	1.45	2.10
Skelp, Sheared Iron, Pittsburgh.....	1.55	1.55	1.50	2.35
Sheets, No. 27, Pittsburgh.....	2.85	2.85	2.90	2.80
Barb Wire, f.o.b. Pittsburgh.....	2.80	2.80	2.80	3.80
Wire Nails, f.o.b. Pittsburgh.....	2.30	2.30	2.30	3.20
Cut Nails, Mill.....	1.95	1.95	1.95	2.50
<b>METALS:</b>				
Copper, New York.....	17.00	17.00	16.75	16.12½
Spelter, St. Louis.....	3.95	3.95	4.05	4.30
Lead, New York.....	4.37½	4.37½	4.37½	4.70
Lead, St. Louis.....	4.17½	4.30	4.30	4.65
Tin, New York.....	26.50	26.75	26.25	25.50
Antimony, Hallett, New York.....	9.25	9.25	9.25	9.75
Nickel, New York.....	55.00	55.00	55.00	38.00
Tin Plate, Domestic Bessemer, 100 lbs., New York.....	4.19	4.19	4.19	4.84

### Chicago. (By Telegraph.)

Office of *The Iron Age*, 1205 Fisher Building, Chicago, January 9, 1901.

The prominent feature of the market is the continued receipt of heavy specifications on contracts. New business is also coming forward in satisfactory volume in most lines, but especially in finished products. The difference is marked between conditions now existing and those at the opening of last year. Then we were starting in on a period of liquidation and adjustment. Prices were very high and consumers were doing everything possible to secure lower rates. The outlook now is bright. Prices are on a plane which is considered reasonable and a much better demand is expected as the year advances. The holiday and stock taking period has been passed with not only no weakening in prices, but a decided tendency to higher figures. Railroads are heavy buyers of supplies, especially Rails and rolling stock. The Illinois Central has just placed an order for 40 locomotives with Pittsburgh manufacturers.

**Pig Iron.**—Manufacturers are so busy taking care of shipments on contracts that they are not worrying over the limited amount of new business now being received. Deliveries are on a large scale, with shippers and consumers in a constant state of ferment over the shortage of cars, especially on roads carrying Southern Iron. Foundrymen are enjoying a good demand for their products and many of them report that they will be ready to place further orders for Iron before the close of the month. The Calumet and Minerva furnaces go in blast this week. Prices are firmly held, with absolutely no rumors current as to concessions. Quotations are as follows:

Lake Superior Charcoal.....	\$19.50 to \$20.00
Local Coke Foundry, No. 1.....	15.50 to 16.00
Local Coke Foundry, No. 2.....	15.00 to 15.50
Local Coke Foundry, No. 3.....	14.50 to 15.00
Local Scotch, No. 1.....	15.50 to 16.25
Ohio Strong Softeners, No. 1.....	16.25 to 16.50
Southern Silvery, according to Silicon.....	16.10 to 16.60
Southern Coke, No. 1.....	15.35 to 15.85
Southern Coke, No. 2.....	14.60 to 15.10
Southern Coke, No. 3.....	14.10 to 14.60
Southern Coke, No. 1 Soft.....	15.35 to 15.85
Southern Coke, No. 2 Soft.....	14.60 to 15.10
Foundry Forge.....	13.60 to 14.10
Gray Forge and Mottled.....	13.60 to 14.10

Southern Charcoal Softeners, according to Silicon.....	15.00 to	17.00
Tennessee Silicon Pig.....	17.00 to	18.50
Alabama and Georgia Car Wheel.....	20.00 to	20.35
Malleable Bessemer.....	15.00 to	15.50
Standard Bessemer.....	15.00 to	15.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	17.50 to	18.50

**Bars.**—The situation is very satisfactory to manufacturers. Good orders are steadily being placed for both Bar Iron and Steel Bars. Prices are firm and repeated efforts by large buyers to place contracts below the current rates, especially on Steel Bars, have been without success. Specifications are fully up to contracts, and in numerous cases are running ahead of the terms made, showing that consumers are as busy as they expected to be, if not more so. Mill shipments of Common Iron continue to be quoted at 1.45c. to 1.50c.; Soft Steel Bars, 1.40c. to 1.45c., and Hoops, 1.95c., base, Chicago. Jobbers report a continued good demand from store, with some anxiety among their customers relative to their ability to secure prompt deliveries of material needed during the next few weeks. So much difficulty has been experienced in securing shipments from mills within agreed time that buyers are insisting on better service. Prices of small lots are firmly held at 1.75c. to 1.80c. for Common Iron, 1.60c. to 1.70c. for Steel Bars, and 2c. to 2.20c. for Hoops.

**Car Material.**—The car builders continue actively employed. Fresh orders for cars are constantly being placed. Manufacturers of car material are in daily receipt of good orders for everything under this head, and some of the largest manufacturers are oversold and are obliged to purchase from others to fill their contracts.

**Structural Material.**—Daily sales to builders and bridge manufacturers, although consisting of small lots, run up to a good aggregate. Business of this kind is sufficiently large to make a fine showing for each month. December was thus the largest month in the history of one of the structural companies doing business here. No large contracts were placed during the past week, but some excellent building projects are rapidly getting to the point of being placed under contract. Some round lots have been procured for this purpose by manufacturers. Mill shipments are quoted as follows: Beams Channels and Zees, 15 inches and under, 1.65c.; 18 inches and over, 1.75c.; Angles, 3 inches and over, 1.55c.; Angles, under 3 inches, 1.55c. rates; Tees, 1.70c.; Universal Plates, 1.55c. to 1.60c. Small lots of Beams and Channels from local yards are quoted at 2.10c. to 2.25c.; Angles, 1.60c. to 1.70c. rates, and Tees, 1.75c. to 1.85c.

**Plates.**—The volume of business is large, both for mill shipments and from store. A sale of 4500 tons was made by the Illinois Steel Company to go to the Atlantic Coast. This is partly due to the sold up condition of Eastern mills and partly to the excellent reputation of the local product. Jobbers have seldom had so good a business from stock in January as they are now enjoying. Mill shipments of Tank Plate, ¼-inch and heavier, in carload lots, are quoted at 1.55c. to 1.60c., Chicago; Flange, 1.65c.; Marine, 1.75c. Jobbers quote small lots from store at 1.80c. to 2c. for Tank, and 2c. to 2.10c. for Flange.

**Sheets.**—The heavy demand noted for some time past has not yet abated. Large consumers are contracting freely for their spring requirements. Galvanized Sheets are in especially strong request, as stocks are extremely light. The local jobbers continue to have a demand for quick shipment from large buyers further West. Black Sheets are not so active as Galvanized, but trade is, nevertheless, in good condition. Mill shipments of No. 27 Black are quoted at 3.15c., Chicago, while Galvanized Sheets are held at 70 and 7½ off. Small lots from stock are quoted at 3.30c. to 3.40c. for No. 27 Black, 2.40c. for No. 16, 2.30c. for No. 14, 2.10c. for No. 12, 2c. for Blue Annealed No 10, and 70 off for Galvanized.

**Merchant Pipe.**—Considering the season, the demand is particularly good. Manufacturers' prices, random lengths, are as follows:

	In carloads.	Less than carloads.
	Blk. Galvd.	Blk. Galvd.
¾ to 1½ inch and 11 to 12 inches.....	59.2 46.2	54.9 40.9
¾ to 10 inches.....	66.7 53.3	61.9 49.9

Some effort is being made to change the price of Boiler Tubes, but up to this time quotations have not been revised. Quotations are continued as follows:

	Steel.	Iron.
1 to 2¼ inches, inclusive.....	50	40
2¼ inches.....	50	42½
2½ to 5 inches.....	60	50

**Cast Iron Pipe.**—Inquiries are very good and a fair run of orders is being booked thus early in the year. Manufacturers are confident that this will be one of the best years for the Pipe trade.

**Rails and Track Supplies.**—Railroad companies are freely contracting for their requirements for Steel Rails. Sales in one day the past week ran up to 26,000 tons. Very heavy business is in sight. One inquiry now under negotiation calls for 65,000 tons. The demand for Light Rails is also large, sales the past week aggregating 8000 tons. Rail prices have not yet been marked up, but the indications are strongly in favor of an advance. Heavy Sections of Steel Rails continue to be quoted at \$26 and Light Sections at \$25.50 to \$28, according to weight. Track Supplies are in very good demand, with Splice Bars still held at 1.40c.; Spikes, 1.65c. to 1.75c.; Track Bolts, with Hexagon Nuts, 2.55c., and Square Nuts, 2.40c.

**Billets.**—No sales are reported of Bessemer Billets, but a steady run of orders is being received for Open Hearth Billets, which are quoted at \$23.75 in carload lots and at \$28 for small lots from store.

**Merchant Steel.**—Railroad companies and other large consumers of Tool Steel are placing contracts for their supplies for the next six months. The demand for other forms of Merchant Steel is rather light at present, but specifications on contracts are being received about as fast as they can be handled by the mills. An advance has been made in Cold Rolled Shafting. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.75c. to 1.90c.; Smooth Finished Tire, 1.75c. to 1.95c.; Open Hearth Spring Steel, 2.15c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.70c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off. Ordinary grades of Crucible Tool Steel are quoted at 6c. to 7c.; Specials, 13c. upward.

**Old Material.**—Dealers are offering their holdings more freely, hence the volume of business has been somewhat larger. The railroad lists this month are considerably heavier than they have been and prospects, therefore, favor lower rather than higher prices. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$13.50 to \$14.00
Old Steel Rails, mixed lengths.....	10.00 to 10.50
Old Steel Rails, long lengths.....	11.00 to 11.50
Heavy Relaying Rails.....	18.00 to 20.00
Old Car Wheels.....	16.00 to 17.00
Melting Steel Scrap.....	10.00 to 10.50
Mixed Steel.....	8.00 to 9.00
No. 1 Mill.....	7.50 to 8.00
No. 2 Mill.....	6.00 to 6.50
No. 1 Busheling.....	8.50 to 9.00
No. 2 Busheling.....	7.50 to 8.00

The following quotations are per net ton:

Iron Fish Plates.....	\$16.50 to \$17.00
Iron Car Axles.....	18.00 to 18.50
Steel Car Axles.....	15.00 to 15.50
No. 1 Railroad Wrought.....	14.00 to 14.50
No. 2 Railroad Wrought.....	12.00 to 12.50
Shafting.....	15.00 to 16.00
No. 1 Dealers' Wrought.....	10.00 to 11.00
No. 1 Country Wrought.....	9.00 to 10.00
Iron Axle Turnings.....	9.50 to 10.00
Soft Steel Axle Turnings.....	8.00 to 8.50
Machine Shop Turnings.....	7.50 to 8.00
Wrought Drillings.....	5.00 to 5.50
Cast Borings.....	3.00 to 3.50
Mixed Borings, &c.....	4.00 to 4.50
No. 1 Bolders, cut.....	9.00 to 9.50
No. 2 Bolders, cut.....	7.50 to 8.00
Boiler and Ship Scrap.....	6.50 to 7.00
Heavy Cast Scrap.....	12.00 to 12.50
Stove Plate and Light Cast Scrap.....	8.50 to 9.00
Railroad Malleable.....	12.00 to 12.50
Agricultural Malleable.....	10.50 to 11.00

**Metals.**—Carload lots of Lake Superior Copper continue to be held at 17½c. and Casting brands at 17¼c. Pig Lead is quiet, but prospects are very bright for a good business in the near future. Desilverized Pig Lead is unchanged at 4.32½c. and Corroding at 4.42½c., in 50-ton lots.

**Coke.**—An active trade is in progress, especially in Foundry Coke, which is still quoted at \$4.50 to \$5 for 72-hour Coke.



The office of the Park Steel Company, for some time maintained with that of Howe, Brown & Co., Chicago, has been removed to the Park Steel Company's warehouse, at 50 and 52 South Canal street, Chicago. Andreas Hartel, Jr., formerly manager of the Boston branch of the Park Steel Company has been transferred to Chicago, to manage the Chicago branch.

### Cincinnati. (By Telegraph.)

Office of The Iron Age, Fifth and Main streets, {  
CINCINNATI, January 9, 1901. }

All grades of Pig Iron, excepting mill stock, is starting off in as satisfactory a manner as could be expected. The amount of Iron sold shows increasing interest, and the inquiry indicates a good steady trade. Foundry Irons are unchanged as to values, and were it not for the uncertain feeling regarding mill grades they would be considered strong on the basis of to-day's quotations. The only weak spot in the market is in Mill Irons, and there is a feeling that this may possibly extend to other lines. Gray Forge is openly offered at \$9.50, Birmingham, and could be bought at even a lower figure than that under certain conditions. There is a noticeable effort on the part of buyers again to beat the market thoroughly for special figures where the amount of Iron wanted runs up to any considerable tonnage. The situation on the whole is hardly so strong as it was a week ago, yet it would hardly be fair to call it weaker, except as noted above. Freight rate from Birmingham is \$2.75 to this point; from Hanging Rock district, \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$14.25 to \$14.50
Southern Coke, No. 2.....	13.75 to 14.00
Southern Coke, No. 3.....	12.75 to 13.00
Southern Coke, No. 4.....	12.50 to 12.75
Southern Coke, No. 1 Soft.....	14.25 to 14.50
Southern Coke, No. 2 Soft.....	13.75 to 14.00
Southern Coke, Gray Forge.....	12.25 to 12.50
Southern Coke, Mottled.....	12.25 to 12.50
Ohio Silvery, No. 1.....	17.00 to 17.50
Ohio Silvery, No. 2.....	16.00 to 16.50
Lake Superior Coke, No. 1.....	15.50 to 16.00
Lake Superior Coke, No. 2.....	14.50 to 15.00
Lake Superior Coke, No. 3.....	13.50 to 14.00
Southern Basic.....	.... to 14.25

#### Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades.....	\$18.75 to \$19.75
Standard Southern Car Wheel No. 2.....	17.75 to 18.75
Lake Superior Car Wheel and Malleable.....	19.00 to 20.00

**Plates and Bars.**—Quotations are unchanged, and business has been fairly satisfactory.

**Old Material.**—The market has been fairly steady, and is practically unchanged. Dealers' buying prices per gross ton are, f.o.b. Cincinnati: No. 1 Wrought Railroad Scrap, \$15; Cast Railroad and Machinery Scrap, \$11; Old Iron Axles, \$16.75; Iron Rails, \$18; Steel Rails, rolling mill lengths, \$13; short lengths, \$12; Car Wheels, \$15.

### Philadelphia.

Office of The Iron Age, Forrest Building, {  
PHILADELPHIA, PA., January 8, 1901. }

The trade are trying to get down to business again, but with the exception of Finished Material there is a somewhat unsettled feeling in regard to prices. It cannot be said that there is any distinct weakness, but there is no snap to the market and some holders are unquestionably accepting less money than they would have done before Christmas. Nevertheless, a great deal of Iron is wanted, and it may be a little premature to assume that prices are going to be lower. The market requires a start, however, and buyers and sellers alike are waiting for somebody to set the pace. It is not unlikely that the publication of the furnace report will have considerable influence, but in any event bids and sales since the turn of the year are at less money than they were during the early portion of December. This refers to lots of 1000 up to 5000 tons, of which quite a heavy tonnage has been placed. There are still very many inquiries in the market, and, while sellers are willing to accept last month's prices, they are certainly not pressing sales in a way that shows any great anxiety to secure business. As we said before, however, it is a waiting market, and is liable to "follow your leader" when such can be found.

In other directions the feeling is distinctly strong, and the demand for all kinds of finished work something extraordinary considering the season. With such underlying conditions it is impossible to feel very bearish, yet the fact must be kept in mind that production is on a large and increasing scale, and that cost sheets are likely to be much more favorable than they have been for quite a while past. The general idea is that the volume of business will be very large, with prices not materially different from those quoted to-day.

**Pig Iron.**—Some large lots of Iron have been taken by the Pipe Founders, and also a considerable quantity of Sand Basic, probably 20,000 tons all told. Prices were lower than were quoted last month, but there was rather close competition for these orders, and to secure them prices were cut rather sharply. It does not appear that the higher grades of Foundry Iron have been affected to any extent, although in one or two instances for 1000-ton lots and upward less than \$15 was accepted for No. 2 Plain and \$15.50 for No. 2 X. A block of a good many thousand tons of No. 1 X was also reported as sold at less than \$16 at tide, and in other cases strictly gilt edged buyers have made very favorable arrangements. This is almost invariably the case, however, after a two or three weeks' abstention from the market, although when the rank and file come in prices may be quoted just as they were before the holidays, in which event the concessions made to large buyers have no special significance. As a matter of fact, the prices are liable to be stronger because of the improved condition of order books, due to such sales as above mentioned. Granting all this, it is nevertheless true that the market is on trial, and the best judges, so far as we can understand, are not ready to take any distinct position. They see possibilities *pro* and *con*, and meanwhile, unless inducements are offered them, they are disposed to "stand by" until there are further developments. To-day's prices for Philadelphia and nearby points are about as follows: No. 1 X Foundry, \$16 to \$16.50; No. 2 X Foundry, \$15.50 to \$16; No. 2 Plain, \$14.75 to \$15.25; Standard Gray Forge, \$14.50 to \$15; Ordinary Gray Forge, \$14 to \$14.25; Basic (Chilled), \$14.50 to \$14.75; Basic (Sand), \$14 to \$14.25.

**Billets.**—There is not much doing at present, the only sale of importance being one of 3000 tons made several days ago at something less than \$21 for Open Hearth Steel delivered to mill about 100 miles west of Philadelphia. Seaboard prices, \$21 for Bessemer and \$22 for Open Hearth.

**Plates.**—There is a heavy demand, and large sales have been made since the holidays. Lots of 1000 to 5000 tons each are by no means exceptional, and there is little doubt that the mills will have all the business they can possibly handle during the spring and summer months. Prices are unchanged, the expected advance having been postponed, and for the present quotations are as follows: Plates, ¼-inch and thicker, 1.55c. to 1.60c.; Universals, 1.55c. to 1.60c.; Flange, 1.65c. to 1.75c.; Charcoal Iron Plates, C. H. No. 1, 2.25c.; Best Flange, 2.75c.; Fire Box, 3.25c.

**Structural Material.**—There is an enormous amount of business on the books, and, judging from the large quantities of Pig and other material which are being called for by these interests, it is believed that the mills have entered a great deal of new work within a very recent date. Deliveries are hard to get with reasonable promptness, although all departments are being run to full capacity, and prices are firm, as follows, viz.: Angles, 3-inch and upward, 1.65c. to 1.75c.; less than 3 inches, 1.50c. to 1.60c.; Beams and Channels, 15-inch and upward, 1.65c. to 1.75c.

**Bars.**—The market is rather quiet at present, but prices are firmly maintained. A good many orders were carried over from last year, and for the present these keep the mills pretty well employed. Prices are as follows for city or nearby deliveries: Refined Iron Bars, 1.45c. to 1.55c.; Steel Bars, 1.40c. to 1.50c.

**Sheets.**—The demand is very good and mills are crowded to their full capacity. Prices are a shade dearer, and are now quoted as follows for best Sheets



(common Sheets two-tenths less): No. 10, 2.20c.; No. 14, 2.40c.; No. 16, 2.60c.; Nos. 18-20, 3.10c.; Nos. 21-24, 3.20c.; Nos. 26, 27, 3.30c.; No. 28, 3.40c.

**Old Material.**—Market not very active, but prices are unchanged, except Steel, which is 50c. to \$1 per ton lower than it was during December. Bids and offers for deliveries in buyers' yards are about as follows: Choice Railroad Scrap, \$18 to \$18.50; No. 1 Yard Scrap, \$13 to \$14; No. 2 Light Scrap, \$11.50 to \$12.50; Machinery Cast, \$14.50 to \$15; Heavy Steel Scrap, \$14.50 to \$15; Old Iron Rails, \$18 to \$18.50; Old Steel Rails, \$15 to \$15.50; Wrought Turnings, \$9.75 to \$10.25; Cast Borings, \$7.75 to \$8.25; Old Car Wheels, \$17 to \$18; Iron Axles, \$20 to \$22; Steel Axles, \$17 to \$18.

The firm of Barclay W. Cotton & Co., Iron and Steel merchants, 418 Walnut street, Philadelphia, have been dissolved by mutual consent, Lincoln W. Gruber retiring. The business heretofore conducted by said firm will be continued by Barclay W. Cotton under the same style and at the same address.

### St. Louis. (By Telegraph.)

Office of The Iron Age, 1905 Chemical Building, {  
St. Louis, January 7, 1901. }

**Pig Iron.**—The market is still in a quiet condition. Prospects are considered bright, but the time is not far enough removed from the inventory period to bring out anything but urgent wants. There is a fair tonnage in action from day to day, consisting of car lots to 100 tons. The larger buying was limited to one lot of 500 tons Malleable Bessemer and an aggregate of 1000 tons Southern Foundry. The stack of the St. Louis Blast Furnace Company, known as Missouri Furnace, recently blown in after repairs, is now working in full capacity. Large producers are apparently holding prices on their brands quite firm at the maximum figure below. We quote, f.o.b. St. Louis:

Southern, No. 1 Foundry.....	\$14.75 to \$15.00
Southern, No. 2 Foundry.....	14.25 to 14.50
Southern, No. 3 Foundry.....	13.75 to 14.00
No. 1 Soft.....	14.75 to 15.00
No. 2 Soft.....	14.25 to 14.50
Gray Forge.....	13.25 to 13.50

**Bars.**—Business conditions are reported as improved since January 1. While few large contracts are being closed, the number of more modest orders foot up an inviting tonnage. Negotiations are under way, however, which involve several more extensive deals. Jobbers say the inquiries received to date give promise of good business in the near future. Mill prices for both Iron and Steel in heavy tonnage are 1.45c. to 1.50c., half extras, East St. Louis. Jobbers' price on less than carloads is 1.75c. to 2c., full extras.

**Rails and Track Supplies.**—Trading is more extensive following the holiday quietness. Railroads seem in good shape financially and send in a very favorable demand for Track Supplies. We quote Splice Bars 1.50c. to 2c.; Bolts, with Square Nuts, 2.30c. to 2.40c.; with Hexagon Nuts, 2.40c. to 2.50c.; Spikes, 1.70c. to 1.80c.

**Pig Lead.**—No change to market. Prices seem a little easier. It is claimed sales of Missouri Lead are now made at 4.17½c., irrespective of brand. Producers of Chemical quote 4.20c., however. Desilverized is still held at 4.32½c. Lead Ore unchanged at \$46.

**Spelter.**—The market is still heavy at 3.95c. Rumored that this price has been shaded. Zinc Ore held top price of \$28.

J. G. Caldwell, formerly president Birmingham Rolling Mill Company, succeeds E. C. Hanpeter, resigned, as manager Tudor Iron Works, East St. Louis, of Republic Iron & Steel Company. Mr. Hanpeter resigned to engage in the manufacture of Iron Beds on his own account.

The American Steel Hoop Company have appointed W. J. Wetstein district sales agent at St. Louis. John R. Scott remains with the company as assistant district sales agent. The American Sheet Steel Company, of which W. J. Wetstein is also district sales agent, and the American Steel Hoop Company now occupy joint offices at 314-317 Security Building, St. Louis.

The Sligo Iron Store Company, St. Louis, find it necessary to provide additional floor space for their overflow stock. A four-story building, 65 x 142 feet deep, originally constructed as an Iron warehouse, located opposite their present stores, has been secured. They will also shortly take the building adjoining headquarters, which will give them a clear frontage of 155 feet.

### Pittsburgh.

Office of The Iron Age, Hamilton Building, {  
Pittsburgh, January 9, 1901. }

(By Telegraph.)

**Pig Iron.**—There has been some buying of Bessemer Pig Iron lately, but in a general way the whole Pig Iron market is quiet. The new wage scale at the Valley furnaces does not go into effect until February 1. Forge and Foundry Iron are quiet and prices are not as firm as they were some time ago. We quote Bessemer at \$13 to \$13.25; Gray Forge, \$13.15 to \$13.25; No. 2 Foundry, \$14.25 to \$14.50, all f.o.b. Pittsburgh. Sales aggregating 7000 to 8000 tons of Bessemer Iron are reported at about \$13, Pittsburgh.

**Billets.**—The Billet makers met in New York on Friday, January 4, and reaffirmed present prices on Billets. A moderate tonnage is being placed. We quote Bessemer Billets, Pittsburgh, Wheeling and the Valleys, at \$19.75, delivered. Billets smaller than 3¾ inches are \$1 extra. Carbons higher than 0.21 and up to 0.60 are \$1 extra; 0.61 up to 1 are \$2 extra. Basic Open Hearth Steel, \$1 a ton extra over the price of Bessemer. For cutting small Billets, 50c. per ton extra.

**Steel Rails.**—We may state that the price of Steel Rails will be advanced to \$27 or \$28 a ton this month.

**Muck Bar.**—The market is weak and we quote nominally at \$25, delivered, Pittsburgh. On a firm offer this could be shaded.

**Sheet Bars.**—There is nothing of interest to note. The mills reaffirmed present prices at a meeting held last week. We quote Sheet and Tin Bars at \$20.75, delivered, Pittsburgh, Wheeling and Valley districts. For cutting Sheet and Tin Bars, 50c. per ton extra.

**Structural Material.**—It is reported that the contract for the Tenth Street Bridge of the Fort Wayne Railway has been given to the American Bridge Company. It will require fully 10,000 tons of material.

(By Mail.)

The Iron trade is without special feature and continues quiet. However, the heavy tonnage booked by the mills some time since, together with new orders being placed, will keep the mills filled up for the next two or three months. Prices on nearly everything, with the possible exception of Pig Iron, are firm, but are without material change. The railroads are again wrestling with the question of a reduction in freight rates on articles of Iron and Steel from Pittsburgh to seaboard. The present rate in carload lots on articles of Iron and Steel from Chicago to New York is 30c., and Pittsburgh pays 60 per cent. of this, which is 18c. It is proposed to reduce the rate in carloads between the two extreme points to 25c., which would mean a rate from Pittsburgh to New York of 15c. The present Billet rate between Pittsburgh and New York is \$2.90, and it is proposed to reduce this to \$2.70. However, unless heavier reductions in rates than these are made, it is not likely Pittsburgh manufacturers will be satisfied. There are reports that the Carnegie Steel Company will build a road to seaboard, but this has not been officially confirmed, and is probably untrue.

**Bars.**—While tonnage being placed in Bars has fallen off a good deal, yet the market is firm and the mills are crowded with orders. There is more of a disposition, however, to buy in small lots, consumers evidently taking the view that prices will not be any higher for some time at least. We quote Steel Bars at 1.25c. at mill, while some sellers are quoting higher. There is a fair demand for Iron Bars, but it has fallen off a good deal lately. We quote at 1.30c. at mill in carload lots. Special grades of Iron Bars are quoted from 1.50c. to 1.75c. at mill.

**Structural Material.**—The strike of the Structural Iron workers in the Pittsburgh district is over, the men being granted their demands. No large jobs have recently been placed, but the Tenth Street, Fort Wayne, railroad bridge, calling for about 10,000 tons, is to be given out this week. It will probably be taken by American Bridge Company, and the material supplied by local mills. The Frick office building on Grant street is being figured on, and will take from 6000 to 7000 tons. A good deal of foreign work is being placed, the American Bridge Company having taken some more foreign contracts. A great deal of tonnage in small lots is also being placed. There is no change in prices, and we quote: Beams and Channels, up to 15-inch, 1.50c.; over 15-inch, 1.60c.; Angles, 3 to 6 inches, inclusive, 1.40c.; over 6 inches, 1.50c.; under 3 inches, 1.25c.; Zees, 1.50c.; Tees, 1.55c.; Steel Bars, 1.25c. to 1.35c., half extras, at mill; Universal and Sheared Plates, 1.40c., all f.o.b. Pittsburgh.

**Ferromanganese.**—We quote 80 per cent. Ferro at \$62.50 in carload lots delivered at buyer's mill.

**Sheets.**—The Sheet trade is in splendid condition, tonnage being large and prices very profitable. Buyers are placing orders for extended delivery, a number of the leading mills having sold Sheets for delivery in April, May and June, and even further ahead. It is claimed that present prices of Sheets allow well equipped mills \$10 or \$12 a ton profit or more. Prices are firm, and we quote No. 27 Black Sheets, box annealed, one pass through cold rolls at 2.85c. to 2.90c.; No. 28, 2.90c. to 2.95c. in carload lots. For less than carloads jobbers get higher prices. There is also a heavy demand for Galvanized Sheets, and the market is firm. We quote at 70, 10 and 5 per cent., f.o.b. at mill.

**Steel Rails.**—The report that an advance in prices of Rails would be made this month has stimulated buying, and a good many domestic orders have been placed, aggregating probably 200,000 tons. We can state that the Rail mills have fully 1,250,000 tons of Rails booked for this year's delivery. The price of Rails may be advanced this month to about \$28.

**Plates.**—The mills comprising the Plate Association met in New York on Thursday, January 3, but made no change in prices. We note a continued good demand for Plates, but not as heavy as some time ago. A good deal of tonnage for lake boats is being placed, and the outlook is that the Plate mills will have all the work they can possibly turn out in the next three or four months. Prices are as follows: Tank quality, ¼-inch and heavier, 1.40c.; 3-16 inch, 1.45c.; under 3-16 inch and above No. 10, 1.50c.; Flange or Boiler Steel, 0.1c. advance over base of Tank; Marine and Fire Box, American Boiler Manufacturers' Association specifications, 0.2c. advance over Tank; Still Bottom Steel, 0.3c. advance over Tank; Locomotive Fire Box Steel and equivalent specifications, 0.5c. advance over Tank, all f.o.b. Pittsburgh.

**Merchant Steel.**—Considering the late season, there is a good demand and some large consumers who placed season contracts some time since have again come in the market and placed more orders. Specifications on old contracts are coming in very freely. Prices are without material change, and we quote: Plow Slabs, ¼-inch and heavier, at 1.60c., base; Tire Steel, 1.35c. to 1.40c.; Toe Calk, 1.70c. to 1.75c.; Open Hearth Machinery, 2c., base; Open Hearth Spring, 2c., base; Hammered Lay Steel, 3c. to 3.25c.; Rolled Lay Steel, 2.75c. to 3c.; Cold Rolled Shafting, 57 per cent. off in carload lots; 52 per cent. in less than carload lots, delivered in base territory. Tool Steel, 7c. and upward, according to quality. On Tool Steel freight is allowed east of the Mississippi River. Terms are 30 days net, except Tool Steel, on which 60 days are allowed, less 2 per cent. off for cash in 10 days.

**Skelp.**—The market is very quiet, and we have not been advised of any recent sales. We quote Grooved Iron Skelp at 1.50c.; Sheared, 1.55c.; Grooved Steel Skelp, 1.35c., and Sheared 1.40c., f.o.b. Pittsburgh; terms four months, or 2 per cent. off for cash in 30 days.

**Tubular Goods.**—There is nothing of special interest to note. There is a good seasonable demand for Pipes and Tubes, and prices are fairly strong, being shaded only by the smaller mills and for good orders. Prices to consumers in carload lots are as follows:

Merchant Pipe.		Black.	Galvd.
		Per cent.	Per cent.
½ to 1½ inch and 11 to 12 inch.....	61	48	
¾ to 10 inch.....	68½	56	
Casing, Random Lengths.		S. & S.	I. J.
2 to 3 inch.....	58	53½	
3¼ to 4 inch.....	63	59	
4¼ to 12½ inch.....	65	61½	
Casing, Cut Lengths.		S. & S.	I. J.
2 to 3 inch.....	53½	49	
3¼ to 4 inch.....	59	55	
4¼ to 12½ inch.....	61½	57½	
Boiler Tubes.		Up to 22 feet.	
		Per cent.	
Steel			
1 inch to 1¾ inch and 2¾ inch to 5 inch, inclusive....	68½		
2 inch to 2¾ inch, inclusive.....	63		
6 inch and larger.....	62		
Iron.			
1 inch to 1½ inch and 2½ inch.....	49½		
1¾ inch to 2¼ inch.....	45		
2¾ inch to 13 inch.....	57		

It should be noted that jobbers are quoted 5 per cent. or more lower prices than the above.

**Coke.**—Output of Coke in the Connellsville region is increasing, and last week 16,746 ovens were active and 4208 idle, the output having been 185,720 tons. The price for strictly Connellsville Furnace Coke is about \$1.75 a ton at oven, but in some cases this has been shaded. Strictly 72-hour Foundry Coke is about \$2.25 a ton. Some low prices are being made on Crushed Coke, and for Coke made outside the Connellsville region much lower prices than the above are quoted.

**Iron and Steel Scrap.**—There is not much doing in Scrap, and there is quite a wide range in prices. There is a good deal of material pressing on the market, and prices are not as strong as they have been. We quote No. 1 Railroad Wrought Scrap, \$114.50 net ton, f.o.b. Pittsburgh; Old Iron Rails, \$18.50 to \$19 Pittsburgh, and \$19.50 Valley, gross ton; Old Steel Rails, \$14 to \$14.50 gross ton; Busheling Scrap, \$12 gross ton; Turnings, \$7 net ton; Cast Iron Borings, \$6 net ton; Old Horseshoes, \$13 gross ton; Heavy Melting Stock, \$13 to \$13.50 gross ton.

## Cleveland.

CLEVELAND, OHIO, January 8, 1901.

**Iron Ore.**—A new Ore carrying road, the Cleveland, Youngstown & Pittsburgh, has been projected to start at Willoughby, a small hamlet east of this city, the intention being to form a new port at that place and to erect Ore docks. No meeting of the Ore Association has been called so far for the purpose of fixing the prices of the various grades of Ore for the coming season. It is expected that this will not be held until the latter part of January or the first of February. Iron men have become restive under the delay, as it is blocking business that might be done beyond the first half of the year. Four big boats, each of 5000 tons carrying capacity and upward, have been added to the Ore carrying fleet during the week. Two of them are owned by Captain J. C. Gilchrist, one by Captain John Mitchell and one by D. R. Hanna, all of Cleveland. The Hanna boat is chartered to carry the product of the Hecla mine.

**Pig Iron.**—Business in Basic Irons is very light, sales both for spot and future deliveries being light. The Bessemer market has not stirred. Basic Iron is quoted at \$13.50 and off-Basic at \$12.50. Foundry Nos. 1 and 2 are quoted at \$14 and \$13.50, respectively, Valley furnace. No quotation of Bessemer is made, although it is approximately \$13.50. Rumors are going of a meeting of the Bessemer Association in prospect to fix the price and to decide to open the furnaces.

**Finished Material.**—The sale of Shapes has been the biggest thing on the market this week. An order was placed for 1400 tons of Shapes for the Scofield Building and two more buildings will be let before the week is out, with yet two other buildings in prospect that will require an equal amount of material. The sales



are so heavy that warnings are being repeated to cover before the capacity of the mills making Shapes share the fate of other grades. The building boom in Cleveland is on and besides the five buildings now in prospect there are also a number of bridges coming that will take up big amounts of material. The prices do not change, being 1.50c. on Beams and Channels, and 1.40c. on Angles. The sales of Rails have also been heavy this week, big orders for electric lines still coming in. Sales this week amounted to 3000 tons of Rails with 10,000 tons in sight that will be closed before another week has passed. The mills have given notice that their plants have been sold up to the limit of their capacity on Plates for some time ahead. Some of them as far as six months. The orders have been tremendous of late and are still coming in. The American Shipbuilding Company are still taking orders for new boats and have been on the market for Steel for two more big ships, the contracts for which will be closed in a couple of days. It appears that there is a difference on the price of Bars between some mills. One has fixed it at 1.25c., while some of the larger mills are holding out for 1.35c. There are few sales, so the price makes but little difference. The Champion Rivet Company and the Upson Nut Company are bidders for the contract for 2000 tons of Rivets to go into the two battle ships now being built by the Government. Lampson & Sessions have also put in a bid.

**Old Iron.**—The market is still a waiting one. The buyers appear to have covered their needs some months ago and are now making use of what they have in stock. One thing is very certain, they are not buying. The sales this week have been both very few and very small. Dealers attribute the backwardness of the market to the uncertainty in the prices of Ore. The lack of interest in the commodity forbids an accurate quotation of the market.

## Birmingham.

BIRMINGHAM, ALA., January 7, 1901.

The market has hardly yet put off its holiday clothes and settled down to business. The volume of trade has been fair, but nothing occurred to indicate any movement on the part of buyers. There is considerable effort being made to get the old business cleaned up and out of the way in anticipation of an active market. Special pains has been taken to sound the furnace interests on the prospects for business, and there is no instance when other than a hopeful view has been taken of the situation. The agents of all the interests are unanimous in anticipating and reporting fine prospects for an active trade, to set in this month. But with it you hear very little talk of any material advance in prices. What is most desired is a steady market. The foreign trade is not "in it," and the probability is that for quite awhile it will cut only a nominal figure in this market. It has had its troubles and its drawbacks, and there have been several instances where buyers have been quick to take advantage of circumstances that favored them. In some cases Iron that has been delivered at port for certain ships has been left on the wharf by the ships, and has remained there for weeks before it could be moved. The consequence was failure to deliver as per contract and claims for damages to settle before delivery was accepted on the other side. But the trade is so important that these irregularities will in time settle themselves.

The Republic Iron & Steel Company have blown out their No. 1 Furnace for a thorough overhauling. There is more or less talk of another interest entering the field in this district and erecting a complete furnace plant, including a Steel mill. But so far all that one can say is that it is being considered. Nothing definite can yet be learned concerning it. There are whispers floating around of changes to be made in management, and of the advent soon of another Steel mill. But the talk becomes less as you approach the ruling authorities. That another will soon be built your correspondent has no doubt. The orders coming to the Steel mill, if they could be executed, would require its operation to full capacity.

As it is, orders at prices very acceptable to that interest have been turned down simply because of inability to supply them. The holidays have interfered with their output, and at a time, too, when they were hard pressed to deliver on orders accepted. But things are gradually resuming normal conditions and in a short time their output will be increased to full capacity. It is not out of place to say that where their product has been sold their orders have been duplicated and increased.

The Bar and Rod mill are running double turn, and they report business as increasing and all they can handle. The Southern Car Works have taken offices here and are laying plans for removal in short order. Their site at Ensley City was contributed equally by the Ensley Land Company and the T. C. I. & R. R. Company. But it will be months before they are ready for business.

Referring now to 1900 the capital stock of the chartered corporations amounted to \$3,787,250. The bank clearances for the year just closed were about \$4,000,000 over the preceding year. The individual deposits during the year almost doubled. The car service reports show for 11 months 415,631 cars, as against 378,683 for 1899. The shipments of Pig Iron show about 840,000 tons, which is about 100,000 tons over 1899. The exports amounted to 225,000 tons for the year 1900. Over 100 miles of railroad have been built during the year. Then we have the Brunswick & Birmingham Railroad, on which dirt has been broken, which will give us a new direct outlet to the Atlantic and prove to be a new feeder to this district; but it will be years before we realize any benefit from this road. The building record during 1900 shows that about \$1,250,000 was spent in that direction. But that does not include all. Improvements and additions foot up fully \$1,000,000 more. It is really hard to overestimate what is going on here. Every industrial enterprise launched here is doing well.

Down at Ensley City a veritable fever has set in, and the scramble for shelter has set in. If the applications for houses could be supplied the population of the town would now be 10,000 people. There is nothing to prevent the population being 25,000 in the next five years.

## New York.

Office of *The Iron Age*, 228-228 William street, {  
NEW YORK, January 9, 1901. }

**Pig Iron.**—Some good blocks of Basic Pig have been sold at somewhat lower prices. For Foundry Iron there has been a good inquiry and prices are steady. Quotations are as follows at tidewater: Lehigh, Schuylkill and Virginia Irons, No. 1, \$17 to \$18; No. 2 X, \$15.50 to \$16; No. 2 Plain, \$14.25 to \$15; Gray Forge, \$14.25 to \$15; Tennessee and Alabama brands, No. 1 Foundry, \$15.50 to \$16; No. 2 Foundry, \$14.50 to \$14.75; No. 1 Soft, \$15.50 to \$15.75; No. 2 Soft, \$14.50 to \$14.75; No. 3 Foundry, \$14 to \$14.25; No. 4 Foundry, \$13.50 to \$13.75; Gray Forge, \$13.50 to \$13.75.

**Cast Iron Pipe.**—No contracts of any magnitude have been closed in this district. We continue to quote \$24.50 to \$25.50 per gross ton for 8-inch pipe at tidewater.

**Steel Rails.**—The meeting of the Rail makers is to be held at an early date. During the week under review no large sales are reported by Eastern mills. One good inquiry is at hand for Girder Rails. We quote \$26 for Standard Sections, \$25 and \$26 for Light Sections, and \$32 to \$32.50 for Girder Rails. We quote Spikes, 1.50c. to 1.60c.; Splice Bars, 1.35c. to 1.40c.; Square Track Bolts, 2.10c. to 2.15c., and Hexagon Bolts, 2.25c. to 2.30c.

**Finished Iron and Steel.**—No contracts of any magnitude have been placed in this market during the past week. There are, however, some jobs of magnitude on which figuring is going on. We quote as follows at tidewater: Beams, Channels and Zees, 1.65c. to 1.70c.; Angles, 1.30c. to 1.40c.; Tees, 1.65c. to 1.75c.; Bulb Angles and Deck Beams, 1.90c. to 2c.; Universal Plate Mills, 1.58c. to 1.60c.; Sheared Steel Plates are 1.58c. to 1.60c. for Tank, 1.68c. to 1.70c. for Flange, 1.78c. to 1.90c. for Fire Box. Charcoal Iron Plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange and 3.25c. for Fire Box. Refined Bars are 1.40c. to 1.45c.; Common Bars, 1.30c. to



1.35c.; Soft Steel Bars, 1.35c. to 1.40c., and Hoops, 1.90c. to 2c., base, on dock.

### Metal Market.

Office of *The Iron Age*, 232-238 William street, }  
New York, January 9, 1901. }

**Pig Tin.**—There has been some lively fluctuation in the London market since our last writing. As a result this market was very unsteady, although it did not rise and fall to the extent of the London fluctuations. There is evidently a strong American party which is endeavoring to send things skyward. They succeeded to the extent of £2 during the week, but lost their hold and prices receded. As a net result this market is to-day  $\frac{1}{2}$ c. lower than that of last week, and the London market finds itself £2 2s. 6d. lower than it was a week ago. Spot Tin is quoted here to-day at 26 $\frac{1}{2}$ c. Futures are nominally 26 $\frac{1}{4}$ c. for January and February. Business has been very light and the demand from the interior is poor. The London market closed to-day £118 17s. 6d. for spot and futures. The Billeton sale, which was held to-day, went at an equivalent of £118 10s., c.i.f. Holland. The arrivals thus far this month amounted to but 42 tons, but about 900 tons will be due next week.

**Copper.**—The market is dull and unchanged. Prices are nominally unchanged, but it is an open secret that quoted values can be shaded. Lake Superior Ingot is quoted 17c. and it is said that purchases can be made at 16 $\frac{1}{2}$ c. Electrolytic and Casting are quoted 16 $\frac{1}{2}$ c., and we hear that these grades can easily be obtained at 16 $\frac{1}{2}$ c. The London market closed to-day £72 10s. for spot and £73 2s. 6d. for three months' futures. Best Selected has declined 10 shillings to £79.

Below is the table as computed by the New York Metal Exchange showing the export statistics for the year 1900.

	*1900.
Domestic production as per producers' returns.....	269,663
Net importations of foreign.....	38,182
Total supplies .....	307,845
Exports of domestic to Europe.....	151,988
Exports of domestic to British North America.....	688
Exports of domestic to Mexico.....	151
Contents of sulphate.....	4,025
Total exportation.....	156,852
Deducting exportations from supplies, there were available for home consumption .....	150,993

\*December estimated.

**Pig Lead.**—There is no change in this market. Business is not brisk and the prices quoted by the American Smelting & Refining Company continue at 4.37 $\frac{1}{2}$ c., New York, for Desilverized, in lots of 50 tons and more, and 4.32 $\frac{1}{2}$ c., St. Louis. The London quotation is a shade higher, with £16 7s. 6d.

**Spelter.**—Is extremely dull, at lower prices. Spot is quoted here to-day at 4.10c. to 4.15c., and St. Louis is reported to be easy at 3.90c. to 3.92 $\frac{1}{2}$ c. London is up 5 shillings, with the closing quotation to-day reaching £19.

**Antimony.**—Is without change, Hallett's being quoted 9 $\frac{1}{4}$ c. and Cookson's 10 $\frac{1}{2}$ c.

**Nickel.**—Is not changed, the same conditions prevailing that have existed for some time. Prices are nominally 55c. to 60c. for small lots.

**Quicksilver.**—Has not been changed, prices quoted here remaining at \$51 per flask of 76 $\frac{1}{2}$  lbs., in lots of 50 flasks and more. The London market is unchanged at £9 2s. 6d.

**Tin Plates.**—A good demand and unchanged prices characterize the market. The demand seems to be well distributed over all portions of the trade. The American Tin Plate Company still quote on a basis of \$4.19 per box of standard 100-lb. Cokes, f.o.b. New York, or \$4, f.o.b. mill. The London price has been advanced a shade and the quotation which is now given is £12 5s.

The American Tin Plate Company have installed in the Shenango and Greer works, at New Castle, Pa., 30 frictionless charging machines made by Jas. D. Swindell, consulting engineer, of Pittsburgh. We are advised that these machines are giving entire satisfaction.

### The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street, }  
New York, January 9, 1901. }

An interesting situation presents itself to one who is endeavoring to ascertain the actual state of affairs in the machinery trade at this time. From the rank and file of the smaller merchants who deal in machine tools, engines, boilers, pumps and general lines of machinery comes a nervous, dissatisfied wail. In these quarters it is stated that immediate business is pretty slow.

With the larger class of engineering firms and machinery merchants conditions are found to be just the reverse. Not only are they gratified with present conditions, but from all quarters comes that welcome but familiar tale of a big inquiry. Talk of large prospective business has been rife for a good many weeks back and it has been cumulative, but now the reports of large projects under way are more numerous and glowing than ever.

The smaller merchants complain something in this wise: "I know there are lots of things in the wind, but actual business is slow. I don't know where I can go this minute and really lay a proposition before a man who wants to buy now."

And this is matched on the other hand with the statement of a prominent engineer who said yesterday: "I have never before seen so many good things coming along as nicely and steadily at one time as there are at present."

It all depends upon the viewpoint. One sees only the orders of to-day and gauges the market accordingly. His neighbor sees bright prospects and indications of future activity. Consequently the market has to him a sound tone.

That the buoyancy of feeling should be manifested by the large interests is but natural, as the promoters of large new enterprises deal with the great interests first. Nevertheless the putting in motion of the large enterprises by the placing of heavy contracts brings about an activity which is reflected down to the smallest interests through the betterment of general conditions. There are indications which forecast anything but a waning market. Signs seem to point in the opposite direction. And this is true in all branches of the mechanical arts.

In the machine tool trade there are a number of very large jobs on the taps and on the very verge of final consummation. Builders of large types of engines are in a position where they cannot consider quick delivery inquiries and are straining every effort to get abreast with the pace. The boiler builders would be in a similar position were it not for the fact that the important plants have been extended considerably during the last year. Makers of cement mill machinery have been extraordinarily busy during the last few months and there are a number of good orders about to be given out. Although the new plants which are going up in the Lehigh district in Pennsylvania have their equipment pretty well contracted for, considerable activity may be looked for in the Michigan cement regions.

For refrigerating and ice making plants there is a constantly increasing demand, due in a measure to the spreading consolidation of the large mutual ice companies.

Economizers, condensers, feed water heaters and automatic stokers are constantly meeting with increased demand owing to the growing cry for economical steam plants. The high price of fuel is also to be taken into account in this connection. Some very good plants, including the modern saving devices, are now being figured on.

As to prices, we hear of no quotable change. In some lines, and notably the machine tool trade, there is an apparent tendency toward stiffening. It is just enough to throw the price question a little toward the sellers' side. For instance, where terms have usually been made f.o.b. factory and the purchaser has used a little persuasion some manufacturers would take the order f.o.b. destination. Such concessions are being stopped.

As we have previously stated, recommendations have

been made by Major Blunt, commandant of Rock Island Arsenal, as to the awards of the long list of machine tools on which bids have recently been received. The matter is now before General Buffington, Chief of the Ordnance Department, Washington. There is apparently a good deal of dissatisfaction among various of the bidders on this work in reference to the recommendations which have been made at Rock Island. It appears that some of the most prominent machine tool builders have been thrown aside to the advantage of less conspicuous builders, who, in some instances, have not been engaged in building the line of machinery on which they have bid. It is said that in certain instances the well-known bidder has been sacrificed, even though lower in price than the concern recommended. In reply to requests made upon the Rock Island authorities by the lowest bidders, asking for reasons for this action, the explanations given are considered entirely inadequate and not only against the interests of the Government but irregular and illegal. A number of the large concerns who feel slighted are up in arms against the proceedings as mapped out at Rock Island and believe that the authorities at Washington will set matters aright before the official awards are made. In another column we print a special report from our representative at Washington regarding the matter. It is said that about 80 per cent. of the items are in dispute.

Regarding the new plant of the American Car & Foundry Company which is to be built in Detroit, Mich., for the purpose of building pressed steel cars, we are informed that the new plant will be known as the New Peninsular plant and that the specifications have just been completed by Westinghouse, Church, Kerr & Co. The machinery, we are informed, will be purchased from Detroit by the manager of the present plant in that city.

It is now rumored that the Southern Car & Foundry Company of Birmingham, Ala., will also build a plant for the purpose of turning out pressed steel cars. The plant, it is said, will be built at Birmingham.

It is reported that the Cramp Ship & Engine Building Company of Philadelphia are buying a large equipment of machine tools for a large new machine shop which is being built.

George Hote, who is to equip the new Elizabethport car shops of the Central Railroad of New Jersey, is said to be purchasing some of the materials required. His offices are located at 150 Fifth avenue, New York.

A large system of shops, including eight buildings, are being built at Baltimore, Md., by the Baltimore Railways Company. They are purchasing the equipment for the various buildings, including a considerable quantity of machinery. The powerful machine shop will be 500 feet long. The contract for the heating apparatus has been awarded to the American Blower Company of 141 Broadway, New York. There will be four very large sets of apparatus, consisting of coils, blowers, engines, &c. The apparatus will be installed through Crook, Horner & Co. of Baltimore, Md.

Two large machine shops are to be built at Pottsdam, N. Y., by the Hannova Falls Water Power Company. They are now purchasing the machinery. The order for the heating and ventilating apparatus has been awarded to the American Blower Company.

We are informed that the recent fire at the plant of the Riker Motor Vehicle Company was not as disastrous as was first feared. The extent of the damage approximates \$50,000. This loss is principally in machine tools, which it is said are now being replaced.

Further purchases were made during the week by the Philadelphia & Reading Railroad Company. They purchased a number of heavy lathes, planers, drills, riveters and punches from Manning, Maxwell & Moore.

In another column we print a report from our Pittsburgh representative regarding the purchases of the British Westinghouse Company.

The Brooklyn Rapid Transit Company have placed the large engine order of which we have made previous mention. The contract was given to the Dickson Mfg. Company of Scranton, Pa. There are six engines in the lot, each of which is to be of 4000 horse-power. This

is the largest engine order recorded in some months. Owing to the quick delivery specified some of the large builders were unable to quote on the work. The engines are to be installed in the new power house, which is to supplant the one recently destroyed by fire. The boilers and other apparatus have not been purchased as yet, but propositions of various builders are now under consideration.

Horace Parshal, who is the consulting engineer for the Yerkes, Charing Cross, London, underground road, is now in this country. He is purchasing a considerable quantity of equipment material. He is stopping at the Hotel Albemarle, New York.

Woolston & Brew of 141 Broadway, New York, have sold to the Lowell Electric Light Company of Lowell, Mass., a 1200 horse-power Brown cross compound condensing engine.

Thomas Gaunt is now purchasing the machinery equipment for the large glucose plant which is to be erected at Shady Side, N. J., by the Standard Oil Company. It will be a 4000 horse-power plant. Mr. Gaunt, who formerly occupied offices at 26 Broadway, is now located at Shady Side, the New York offices having been vacated.

We are informed that the Kilby Mfg. Company of Cleveland, Ohio, have taken contracts for three large beet sugar plants, and are now inquiring for such equipment as they do not build. One of the plants is to be located at Loveland, Col., one at Lansing, Mich., and the third at Saginaw, Mich.

The American Smelting & Refining Company, whose principal offices are located at 71 Broadway, N. Y., are purchasing machinery for equipping a large lead smelting plant, to be located at Murray, Utah. Mr. Ellers, who is now in New York, is negotiating the purchases. He is looking for two 500 horse-power engines.

### Iron and Industrial Stocks.

Considering the enormous volume of transactions on the New York Stock Exchange, the iron stocks have been relatively neglected and have moved over a narrow range. The sensation of the week was furnished by the break in the stocks of the National Tube Company as the result of the announcement that the Carnegie Steel Company will build a very large plant at Conneaut, Ohio. The early heavy drop was largely recovered toward the close by supporting orders.

The stock of the Tennessee Company suffered a heavy decline through the decision of the Executive Committee to pass the dividend on the common stock.

Tin Plate gained further on reports that the common will receive a dividend next week. It is stated that the company earned \$6,000,000 during the last fiscal year.

	Bid.	Asked.
American Bicycle Company, common.....	5½	6½
American Bicycle Company, preferred.....	25	27½
American Bicycle Company, bonds.....	72	75
American Bridge Company, common.....	44	44½
American Bridge Company, preferred.....	94½	95
American Sheet Steel, Common.....	24	26
American Sheet Steel, preferred.....	76½	77
E. W. Bliss, common.....		137½
E. W. Bliss, preferred.....	125	
Cramp's Shipyard stock.....	81	83
Crucible Steel Company, common.....	21	21¾
Crucible Steel Company, preferred.....	78	82
Diamond State Steel.....	3½	3½
Empire Iron & Steel, common.....	6	10
Empire Iron & Steel, preferred.....	38	45
National Enam. & St., common.....	18	20
National Enam. & St., preferred.....	78	82
New Haven.....	5½	5½
Otis Elevator, common.....	29¼	30
Otis Elevator, preferred.....	90½	91
Pratt & Whitney common.....	3½	5
Pratt & Whitney, preferred.....	45	55
Tidewater Steel.....	7½	7¾
U. S. Cast Iron Pipe Company, common.....	5¼	5½
U. S. Cast Iron Pipe Company, preferred.....	34	36
U. S. Projectile.....	100	
Va. C. I. & C., stock.....	5	7
Va. C. I. & C., bonds.....	37	38½
H. R. Worthington, preferred.....	110	115

The Executive Committee of the Federal Steel Company has drafted an amendment to the certificate of incorporation of the company which will be presented for adoption at the stockholders' meeting on Tuesday next. This amendment vests the directors with power to declare quarterly dividends on the common stock, and it has been finally decided that at the meeting on Tuesday a lump dividend of 5 per cent. on the common stock for the last year will be declared, and at the same time



## QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING JANUARY 9, 1901.

Cap'l Issued.		Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday	Sales.
\$29,000,000	Am. Car & Foundry, Common.....	22½-23½	22 -23½	22½-23½	22½-22½	22½-23	22 -22½	14,600
29,000,000	Am. Car & Fndry, Pref. (7 % Non-Cu.)	71 -72½	71½-72½	72½-73	72½-73½	72½-73½	-73	9,100
19,000,000	Am. Steel Hoop, Common.....	31½-33	30 -32	30½-32	29 -31	29½-30½	30 -31	13,200
14,000,000	Am. Steel Hoop, Pref. (7 % Cu.).....	77½-78	77½-77½	-77½	-77	77 -77½	.....	3,300
50,000,000	Am. S. & W., Common.....	43½-46½	42½-45	43½-45½	42½-44½	42½-43	42½-44½	82,100
40,000,000	Am. S. & W., Pref. (7 % Cu.).....	87½-88½	87 -88	88 -88½	87½-88	87 -87½	87 -87½	5,400
28,000,000	Am. Tin Plate, Common, N. Y.....	55½-57½	55 -59	57½-59½	59 -62½	59½-62½	60 -61	73,600
18,325,000	Am. Tin Plate, Pref., N. Y. (7 % Cu.)..	.....	.....	-91	.....	90½-91½	-90½	14,600
7,500,000	Bethlehem Iron†.....	-59	-58½	.....	-59	.....	-56	114
15,000,000	Bethlehem Steel, par \$50, \$1 paid in...	-19½	.....	.....	-19½	.....	-19	455
7,974,550	Cambria Iron, Philadelphia*.....	45½	-45½	.....	45½-46	-45½	-45½	175
16,000,000	Cambria Steel**.....	20½-21	20 -20½	20½-20½	20½-20½	20½-20½	20½-20½	7,921
11,000,000	Colorado Fuel & Iron.....	52½-54½	53½-54½	53½-55½	53 -54½	52 -53½	52½-54½	31,700
46,484,300	Federal Steel, Common.....	53 -58	53½-56½	54½-57	54½-55½	54 -55½	55 -56½	143,800
53,253,500	Federal Steel, Pref. (6 % Non-Cu.)....	76½-77½	76½-76½	76½-77	76 -76½	75½-76	75½-76	8,100
32,000,000	National Steel, Common, N. Y.....	41 -44½	41 -42½	43 -44	41½-42½	41 -42½	41½-42½	20,400
27,000,000	National Steel, Pref., N. Y. (7 % Cu.)..	.....	92½-92½	.....	.....	-93	92½-93	1,000
40,000,000	National Tube, Common, N. Y.....	66 -68	64 -67½	66½-68	66½-67	63½-65½	59½-63	47,800
40,000,000	National Tube, Pref., N. Y. (7 % Cu.)..	105 -105½	104½-105	105 -106	104½-105	104 -104½	93 -101	5,950
5,000,000	Penna., Common, Philadelphia.....	.....	-74	.....	.....	-74	.....	60
1,500,000	Penna., Pref., Philadelphia.....	.....	.....	.....	.....	.....	.....	.....
12,500,000	Pressed Steel, Common.....	50½-51½	49½-50½	50½-51	49½-50½	47½-48	47 -47½	4,650
12,500,000	Pressed Steel, Pref., (7 % Non-Cu.)....	.....	.....	-83½	.....	82 -82½	81 -82	700
27,191,000	Republic Iron & Steel, Common.....	16½-17½	16½-16½	16½-17	-16½	15½-16½	15½-16½	6,100
20,306,900	Repub. Iron & Steel, Pref. (7 % Cu.)..	63½-64½	63 -64	63½-64	-64	63½-63½	63½-63½	2,100
7,500,000	Sloss-Sheffield S. & I., Common.....	.....	.....	.....	.....	.....	.....	.....
6,700,000	Sloss-Sheffield S. & I., Pref. (7 % Non-Cu.) .....	-69	.....	-68	.....	68 -69	.....	600
20,000,000	Tennessee Coal & Iron.....	62½-66½	62 -64½	58½-65½	53 -59½	52 -55	54½-56½	98,100
1,500,000	Warwick Iron & Steel (par \$10).....	.....	.....	.....	-8	.....	-7½	925
15,000,000	International Pump, Common.....	28½-28½	28 -28½	.....	-28	27½-28	.....	975
12,500,000	International Pump, Preferred.....	76 -76½	.....	.....	.....	-77	.....	400
11,000,000	International Silver.....	7½-8½	8½-10½	10½-11	10 -10½	-10	8½-9	7,700

\* Par \$50. \*\* \$10.50 per share paid in. † 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. ‡ Ex-dividend.

**Bonded indebtedness:** Am. S. & W., \$190,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., \$2,000,000 6% debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., \$9,822,000 Illinois 5%, \$7,417,000 E. J. E. R. R. 5%, \$1,600,000 Johnson 6%, \$6,732,000 D. & I. R. R. 5%, \$1,000,000 3d D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel, \$2,561,000 6%; National Tube, none; Tennessee C. I. & R. R. Co., \$8,367,000 6%, \$1,114,000 7%, \$1,000,000 7% cu. pref.; Pennsylvania Steel, \$1,000,000 5%, Steelton, 1st, 1917, \$2,000,000 5%; Sparrow's Point, 1st, 1922, \$4,000,000, consolidated, both plants; Bethlehem Iron, \$1,251,000 5% maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6% \$880,000, Col. Coal & Iron Co. Mort. 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,303,000. Also outstanding \$2,000,000 preferred stock on which dividends have been paid to June 30, 1900. Sloss-Sheffield St. & I. Co., Sloss I. & S. first mortgage 6%, \$2,000,000, Sloss I. & S. general mortgage 4½% \$1,835,000.

the amendment to the charter adopted that a quarterly dividend of 1¼ per cent. for the first quarter of the present year will be provided for.

At a recent meeting of the directors of the Diamond State Steel Company it was decided to make an assessment on the stock of \$2.50 a share, to be paid in two installments of \$1.25 each, the first on March 1 and the second on June 1. The money derived from this call is to be used in improving and enlarging the plant.

**Alabama Consolidated Coal & Iron Company.**—The Alabama Consolidated Coal & Iron Company have issued their first annual report, covering the operations for the fiscal year ended October 31, 1900. The income account follows:

Gross earnings .....	\$1,741,387
Operating, taxes and other expenses.....	1,501,366

Net earnings .....	240,021
--------------------	---------

The profit and loss account shows:

November 1, 1899, balance.....	\$37,869
November 1, 1900, net earnings for year ended October 31, 1900 .....	240,021

	\$277,890
--	-----------

Dividends, including that due November 1, 1900.....	158,033
---	---------

November 1, 1900, by balance.....	\$119,857
-----------------------------------	-----------

The Colorado Fuel & Iron Company report for November:

	1900.	1899.	Changes.
Net earnings .....	\$225,467	\$219,251	Inc. \$6,216
From July 1 to November 30—			
Net earnings .....	\$1,145,486	\$753,373	Inc. \$392,113
After deducting from net earnings \$601,790 for bond interest, taxes and preferred stock dividend for year to June 30, 1901, there remains surplus over all charges for entire year of \$543,696.			

**The Tennessee Company.**—The following is the official announcement of the Executive Committee of the Tennessee Coal, Iron & Railroad Company in regard to to-day's dividend action: "The Executive Committee of the Tennessee Coal, Iron & Railroad Company declared the usual dividend on the preferred stock and on the recommendation of the president the dividend on the common stock was not declared for the reason that, although the company had earned, during the past year, 8 per cent. on their common stock, it was not deemed prudent to distribute the money among the stockholders in view of the very large expenditures al-

ready made and to be made in new construction now in progress, for which no new securities have been issued. The company are now building and expect to finish by August 1 next, a continuous billet and rail mill, which will enable the company to put their entire steel output, not deliverable to the Alabama Steel & Wire Company, into finished forms salable in the South. During the past year the company have expended on their steel plant at Ensley large sums in excess of the money raised for that purpose by the sale of bonds. The company have also expended out of their earnings for other permanent improvements large sums, and in view of these facts the committee consider that it would be for the best interests of the stockholders not to distribute at this time surplus earnings in dividends. The committee unanimously approved the selection of D. H. Bacon, now president of the Minnesota Iron Company, as chairman of the Board of Directors of the Tennessee Coal, Iron & Railroad Company." The preferred dividend is payable February 1. Books close January 16 and reopen February 2.

**Pennsylvania Steel Company.**—The Board of Directors of the Pennsylvania Steel Company have adopted the \$50,000,000 reorganization plan. Notices will be sent to the stockholders asking them to deposit their stock in assent to the plan not later than April 1. It is proposed to form a new company having an authorized capital of \$25,000,000 preferred stock and \$25,000,000 common stock, of which \$4,500,000 preferred and \$10,250,000 common will remain in the company's treasury as a reserve, making the actual amount of stock outstanding \$20,500,000 preferred and \$14,750,000 common.

**Dividends.**—The American Tin Plate Company have declared the regular quarterly dividend of 1¼ per cent. on their preferred stock, payable January 31. Books close January 16 and reopen February 1.

The American Steel Hoop Company have declared the regular quarterly dividend of 1¼ per cent. on their preferred stock, payable January 31. Books close January 16 and reopen February 1.

The New Haven Iron & Steel Company have declared the regular quarterly dividend of 1¼ per cent., payable January 21. Books close January 11 and reopen January 22.

The American Car & Foundry Company have declared the regular quarterly dividend of 1¼ per cent. on their preferred stock and a dividend of ½ per cent. on their common stock, payable Feb. 1. Books reopen February 2. The earnings of the company for nine months to November 30 were \$4,196,224.



## OBITUARY.

LORD ARMSTRONG.

Lord Armstrong, the famous inventor and manufacturer of implements of war, died on December 27, at his home, Cragside, Rothbury, England, at the patriarchal age of 90 years. Sir William George Armstrong, first Baron Armstrong, was born at Newcastle-on-Tyne, England, on November 26, 1810, his father being a merchant and alderman of that city. He was educated for the legal profession, and for a few years practiced law. From his early years, however, he had shown a strong bent toward scientific pursuits, making a special study of electricity, then an infant science. His researches in this field resulted in the invention by him of the hydro-electric machine, the most powerful means of developing frictional electricity devised. For this he was elected, while a very young man, a Fellow of the Royal Society of Great Britain. In 1845 Mr. Armstrong definitely abandoned the profession of the law and entered the engineering field. Between that year and 1850 he invented an electric crane and other electrical devices. He also greatly extended the application of hydraulic power to a variety of purposes. In 1847 he and some of his friends founded the now famous Elswick Works. It was in 1854 that Armstrong first became known as an inventor of war material, putting out in that year the rifled gun that bears his name. The Rifled Cannon Committee of the British Army recommended the adoption of the gun, and Armstrong presented the patents to the Government, which knighted him in recognition of his patriotism. Later Sir William extended his system to guns of all sizes, the primary principle being the coiling of one wrought iron tube over another until a sufficient thickness has been reached. Sir William had been appointed Engineer of Rifled Ordnance, but in 1863 he resigned the post and rejoined the Elswick Company, which, ever since then, has been one of the largest manufacturing concerns of its kind in the world, and has taken a leading part in the development of artillery and other implements of war. Sir William was ennobled as Baron Armstrong at the Victorian Jubilee of 1887. In addition he received a long list of honors and decorations from foreign Governments, from universities and scientific institutions, and was a member of many scientific associations. He married in 1835, but leaves no heir to his title.

SAMUEL BRYAN.

Samuel Bryan, well known among the older members of the iron trade in the Pittsburgh district, died on December 20 at the residence of his nephew in Pittsburgh, at the age of 79 years. He was born near Chesapeake City, Md. About 25 years ago Mr. Bryan went to Pittsburgh and became the selling representative for a number of large iron firms. He had been out of active business for a number of years.

EVAN P. WARNER.

Evan P. Warner, secretary and treasurer of the La Follette Coal, Iron & Railway Company, and superintendent of the Tennessee Northern Railway, died December 26, at Knoxville, Tenn.

ALBERT STEINER.

Albert Steiner, who for many years has been conspicuous in the metal trade of New York, died at his home in Brooklyn, N. Y., on Wednesday morning, January 2. Having taken cold during the latter portion of last week, he remained at his home with what was supposed to be a slight attack of "La Grippe." On Monday signs of pneumonia were in evidence, and early Tuesday morning he succumbed very unexpectedly. He was born in Brooklyn in June of 1846, where he resided until his death. Early in life he started his business career as an employee of the then well-known firm of metal merchants of George L. Henser. In 1868 he associated himself with Mr. Behr and organized the firm of Behr & Steiner, and it was as partner of this firm that Mr. Steiner came into prominence in the metal trade. He was especially active in the lead market and was

interested in developing various lead and copper mining properties. In fact, his firm were instrumental in interesting New York capitalists in the Butte copper mines, which have since become famous. Both members of the firm were among the early investors in the latter properties. Among the brokers and commission men dealing in lead Mr. Steiner was one of the most prominent in this country.

WILLIAM WESTLAKE.

William Westlake, a prolific inventor and for many years identified with Western business interests as one of the leading members of the firm of Adams & Westlake of Chicago, died at his home in Brooklyn, N. Y., December 28. Mr. Westlake was born in 1831 in Cornwall, England, and early exhibited the mechanical genius which in later years was to make him a name and fortune. When he was but 14 years old he was the champion maker of horseshoe nails of his county. In the early '40's his father brought the family to this country, locating in Milwaukee, and dying soon afterward. William was the oldest of the children, and the main support of the family devolved on him. After working for various employers, among them John Pritzlaff, he became foreman, in 1857, of the tinsmith department of the old Milwaukee & La Crosse Railroad, and began to turn his attention to the improvement of railroad devices. In 1861, with Master Mechanic Rice of the same railroad, he removed to Chicago and established a railroad supply house. In 1863 he invented the open top adjustable globe railroad lantern, which afterward came into almost universal use. In 1864 he began to manufacture them on a small scale, but the demand was so great that he soon organized the firm of Cross, Dane & Westlake to conduct operations on a large scale. Various changes occurred, until 1875, when the firm of Adams & Westlake, now the Adams & Westlake Company, were organized. Mr. Westlake was granted 260 patents on his inventions. He invented a railroad car lamp; made several improvements on stoves; designed the Adams & Westlake headlight, which is now used extensively, and perfected the Adams & Westlake oil stove. Fifteen years ago Mr. Westlake retired from this firm and moved to Brooklyn. He invested his money in various enterprises that have steadily increased his fortune. He was director in several insurance companies and a holder of stock in various large corporations in New York. Though he had retired from business, Mr. Westlake never lost his active interest in business affairs. All his life he was an indefatigable worker. Up to a few weeks ago he was actively working on plans for a smoke consumer on which he had spent years of toil. He believed that he had about solved the problem of smokeless combustion and was going to place his invention in the boiler room of a trans-Atlantic steamer for a severe test.

E. T. MASON.

Edward Thomas Mason, president of the firm of E. T. Mason & Co., tinware manufacturers, at 193-199 West Twenty-first street, Chicago, died suddenly on December 29. Mr. Mason was born in County Kildare, Ireland, in 1846. When three years old he was taken by his parents to Chicago, remaining there until he was 11 years old, when he went to Detroit. At the beginning of the Civil War he was again in Chicago, and joined the Seventy-second Illinois Volunteer Infantry and served as a private in Company A until the latter part of 1864. He then joined the Thirteenth United States Infantry and served as first sergeant. He was later transferred to Fort Wingate, Ind. Ter., when he served through the Indian wars. In 1868 he returned to Chicago. In 1875 he founded the firm of E. T. Mason & Co.

MOSES HARRIS.

Moses Harris, widely known in the iron trade through his operations in wrecking buildings, died in Chicago on December 31, aged 62. He was born in Russia, but removed to Chicago at the age of 22, engaging soon after in the business of wrecking buildings and disposing of the material. He was the organizer of the Columbian

Wrecking & Salvage Company, who purchased and wrecked the Chicago World's Fair buildings. He was also the organizer of the widely known Chicago House Wrecking Company, who wrecked the Chicago post office building and a number of other large structures not only in that city, but in other parts of the country. His sons are the present officers of the company, but Mr. Harris was not officially connected with the corporation at the time of his death.

J. W. PARKER.

J. W. Parker, chief steel inspector at the Homestead Works of the Carnegie Steel Company, died at the West Penn Hospital, Pittsburgh, on January 3, of typhoid fever. Mr. Parker was taken ill on December 21 while at his home in Lawrenceville, and on Christmas day was removed to the West Penn Hospital. He was 38 years old and had been a resident of Pittsburgh for the past 12 years.

JOSEPH GODCHARLES.

Joseph Godcharles, a member of the nail manufacturing firm of C. A. Godcharles & Co., Milton, Pa., died January 2, aged 48 years..

JOHN R. PETERS.

John R. Peters of Georgetown, Pa., died on December 30, aged 82 years. Mr. Peters invented devices used in the mining of iron ore and other improvements in kindred lines.

**The Pridmore Molding Machine Works.**—Henry E. Pridmore, manufacturer of molding machines, Nineteenth and Rockwell streets, Chicago, is crowded with work. He has recently taken a number of heavy contracts for the Pridmore machine and has just completed some improvements in his plant which were made necessary by the increase in his business. Having found that his power plant had not been adequate to meet the enlarged demand upon it, he has put in a steam plant to displace the gas engines formerly used. For the purpose of housing the new power plant he erected a two-story brick building 34 feet square. The lower floor of this building is used for the engine and boiler rooms, and the second floor for the storage of patterns. Steam is generated with a Standard water tube boiler. The engine is a Vilter-Corliss, of 100 horse-power. Rope transmission on the Webster system is used for transmitting power to the machine shop and foundry. The capacity of the plant is being increased 50 per cent. at this time by the purchase of additional machinery, which will be installed on the second floor of the main building. It is his intention to double the capacity of the works as soon as possible. For this purpose he will erect a three-story building, 60 x 125 feet, to be used as a machine shop. His foreign business is keeping up very well, with the exception of Germany, as industrial conditions there are at present not favorable.

**The Bridge Workers' Strike.**—The strike of the bridge workers in the Pittsburgh district which commenced Monday morning, January 1, lasted only a few days. A committee was appointed which went to New York and conferred with Percival Roberts, Jr., of the American Bridge Company, with the result that that concern signed the scale of the international Association of Bridge and Structural Iron Workers. Their wages have been advanced from 27½ cents an hour for a ten-hour day to 33½ cents an hour for a nine-hour day. This will result in the new wage rate being paid at all the plants of the American Bridge Company in the Pittsburgh district, consisting of the Pittsburgh Bridge Company, Schultz Works, Keystone Bridge Works, Shiffler Bridge Company, and the Youngstown Works, at Youngstown, Ohio. It is probable that the other structural concerns in the Pittsburgh district, the Columbia Bridge Company, Fort Pitt Bridge Company, McClintic-Marshall Construction Company, and Pittsburgh Steel Construction Company, and other smaller interests, will sign the scale this week.

George E. Roberts, Director of the Mint, has made public his preliminary estimate of the production of gold and silver in the United States during the calendar year

1900. The aggregate of gold is given as 3,837,213 fine ounces, valued at \$79,322,281, and of silver, 59,610,543 fine ounces, which, at the approximate average price of 61 cents for the year, makes the value \$36,362,431. During the calendar year 1899 the gold production was \$71,053,400, and the silver production 54,764,500 ounces. The Nome gold and silver production for 1900 is given as \$5,100,000, and that of the Klondike, which includes both the American and Canadian fields, \$22,287,566.

**The New South Wales Steel Rail Contract.**—At Sydney a lengthy continuous sitting of 36 hours of the Legislative Assembly of that colony has recently taken place. Seven hours of this were taken up by a warm discussion of the proposals of an English syndicate, the Blyth River Iron Company, for the supply of 100,000 tons of steel rails, to be manufactured in the colony. The company had previously deposited £10,000 with the Government as a guarantee of their good faith, and are prepared to establish large works in New South Wales. Their proposals bind the Government to take the rails, delivery to be spread over four years, at English prices, plus steamer freight. Two hostile amendments were submitted, but were negatived by 37 votes to 18, and December 1 the proposal was carried. It is estimated these works will provide employment for about 2000 men and will cause the expenditure of about £750,000 within the colony during the next four years. The ore used will be largely taken from the Blyth River Iron Company's property in Tasmania, although the company have agreed to use 25 per cent. of New South Wales iron ore. This was at the Government's request, in order to encourage the working of the local iron ore deposits. A provision for the payment of the minimum wage was inserted in the contract before adoption.

**Otis, Hough & Co.**—In making announcement of changes which went into effect on January 1, by which the firm of Otis, Bonnell & Co. succeeded the old firm of Otis, Hough & Co., we stated that W. F. Bonnell and Frank A. Hough had been admitted as members of the firm. This was incorrect to the extent that it was Frank A. Pope, and not Frank A. Hough, and W. F. Bonnell, who were admitted. The firm of Otis, Bonnell & Co. are sole agents in the Cleveland district for Jones & Laughlins, Limited, of American Iron & Steel Works, Pittsburgh.

**The Sydney Harbor Bridge.**—The report of the committee appointed to examine the designs sent in has been made public. The committee will not recommend the adoption of any of the designs or tenders, and the Premier of the colony has stated his intention of looking into the matter with a view to ascertaining why the combined engineering skill and draftsmanship of the world fail to satisfy the giant intellect of the committee in question. Awards have been recommended, as promised, for the best designs sent in, although even these best are not recommended for adoption.

A large consignment of Tobin bronze plates for the hull of the new cup defender, now building at the Herreshoffs' yard at Bristol, R. I., arrived by freight lately from the works of the Ansonia Brass & Copper Company, Ansonia, Conn. Each plate was crated separately and almost entirely hidden from view. In all there were 26 crates, with a total weight of about 7 tons. The plates are from 12 to 15 feet long and 3½ feet wide. Some are 3-16 inch and others are but 3-20 inch in thickness. This consignment brings the total number of crates now at the yards up to 74.

The Brooklyn Rapid Transit Company are about to make an important addition to their electric power plant at Third avenue and Second street, South Brooklyn, N. Y. A brick and stone structure will be erected for the installment of six engines of 400 horse-power each, to cost in the neighborhood of \$500,000. The Westinghouse Electric & Mfg. Company have been awarded the contract for the engines.



# HARDWARE.

## January Work.

The present month is with many mercantile and manufacturing establishments one in which there is a relaxation of the usual pressure of business. Merchants generally find less demand upon their time for attention to customers as the early winter demand and the holiday rush being over, trade diminishes in volume, making January in this respect one of the quietest months of the year. With manufacturers the condition is somewhat similar. Stock taking and the closing of the books are among the most pressing duties. With both the manufacturers who produce the goods and the merchants, wholesale and retail, who distribute them, there is a certain though brief and partial interruption of the regular course of marketing their wares. During seasons like the present when business is exceptionally good there is perhaps less than usual of this midwinter quiet.

To the business man the month of January is, however, one of especial importance, and much depends on the use which is made of it. While the calendar has no magical power, and the passage from one year to another is the crossing of only an imaginary line, it still remains practically true that January is the time when the merchant naturally looks upon the business as a whole—its extent, its profitableness, its tendency—and makes his plans for its future prosecution. It is the time when the balance sheet is prepared and scrutinized, when the policy for the year is likely to be determined, either deliberately or unconsciously, when reforms are contemplated and perhaps inaugurated, when new enterprises are planned. There may be comparatively little activity in trade, but the proprietor should do a great deal of thinking. The results of his efforts during the past should teach lessons which are to be applied to the future conduct of business. The changing conditions of trade will usually call for some modification of methods which formerly were sufficient and successful. There are, if he be a man of enterprise and resource, pretty certain to be many unexecuted projects, some of them perhaps only half formed, which are awaiting development and which if put into effect would result advantageously.

In view of these considerations there is especial interest in the discussion in following pages in regard to the January work of the Hardware store. A good many of the suggestions of our correspondents, who are progressive and enterprising merchants, will commend themselves to our readers. The principal thing, however, is that each merchant should consider carefully the condition and interests of his business and take action to make it more successful in future.

Especially at this time, when there is so general an improvement in prevailing conditions and business is increasing in volume, is there occasion for the merchant to take his bearings anew and enter with zest and enterprise on the work of the year. With the prosperity which exists and the disposition on all sides to take up and consider new projects there is especial need of alertness and energy on the part of merchants to meet the situation with adequate enterprise, and to make the most of the opportunities presented. If the month is put to its best use it will do much to give character and success to the year's efforts.

## Export Trade.

The United States doubtless stood at the head of the world's list of exporting nations in the year 1900. At various intervals the great nations have fallen behind

in the race for this distinction, until, during the past five years, only the United Kingdom and the United States could be considered as competitors for the distinction of being the world's greatest exporter of articles of home production. In 1894, as appears in the statistics given in another column, the United Kingdom led the United States by nearly \$250,000,000, and in 1897 the United States had so rapidly gained that she was but about \$60,000,000 behind. In 1898 the United States took first place, our exports in that year exceeding those of the United Kingdom by nearly \$100,000,000. In 1899 the United Kingdom again stood at the head of the list, her exports exceeding those of the United States by \$35,000,000. In the 11 months of 1900 the domestic exports of the United States exceed those of the United Kingdom by \$5,473,670, and assuming that this rate of gain has been maintained in December, the United States will, in the year 1900, show a larger exportation of domestic production than any other nation in the world. Parenthetically, it may be observed that the advance in our favor is even greater than the figures show, as it is conceded that Great Britain re-exports quantities of goods which originate in the United States, to say nothing of similar goods absorbed from other countries. The same thing is not true of the United States to any appreciable extent, the figures for the ten months ended October 31, 1900, showing only a total of \$20,852,968 of foreign merchandise exported. Even this distinction, however, of primacy in the world's list of exporting nations but partially tells the story of the marvelous growth of our export trade as contrasted with that of other nations. Comparing the growth of our export trade in the last quarter of the century with that of the other great nations of the world, we are better able to measure the tremendous progress. France shows no increase in her exports of domestic merchandise in the closing quarter of the century; Germany exhibiting during the same period an increase of about 50 per cent.; the United Kingdom showing from 1875 to 1900 an increase of nearly 40 per cent., while the United States during that time records an increase of practically 200 per cent.

## Condition of Trade.

It is as yet too early to look for a marked increase in the volume of trade. The effect of the holidays is still felt, and the attention given to ascertaining the results of the year's business and to planning in regard to future operations is still occupying merchants and manufacturers. Trade is therefore relatively quiet, so far as demand is concerned, and most of what is doing is in a small way to meet early needs. In connection with this there is, however, a good deal of placing of orders by large houses in anticipation of future requirements. Travelers are getting on the road and beginning to be heard from. Many inquiries are coming in to manufacturers from prospective purchasers, and there are in various ways indications of coming business.

## Tone of the Market.

The market remains without important open change in prices, but with a good many minor revisions. In some lines the tendency is to firmness, and in others to slightly lower quotations. The Iron market is being watched with a good deal of interest. Goods which lie near the raw material are generally characterized by a strong tone. Most of the concessions in price are on goods which had not found their proper level after the large advances during the boom period. These changes, therefore, are not regarded as significant of any general weakness in the market as a whole.



## Special Reports.

### Chicago.

(By Telegraph.)

The Hardware trade for the new year can hardly be said to have opened up as yet. Some of the largest houses are not fully represented among the trade, as their traveling salesmen have not yet returned to the field of their labors. Nevertheless their mail orders are quite numerous, which is an assurance of an early activity. The houses whose travelers are out report excellent orders which are running over the whole list of Hardware, indicating that stocks are light among retailers. Few changes have been made in prices and it is not expected that much will be done in this direction until the tendency of prices on heavy products becomes more pronounced. The Heavy Hardware trade has opened up with considerable activity. More anxiety is exhibited by buyers relative to deliveries than prices. The slowness with which shipments have been made from mills and factories is exasperating to the consuming interests, who would like to secure positive assurance that needed material would be delivered to them at the time desired.

### St. Louis.

The consensus of opinion is that the jobbing trade has this week been in receipt of the largest number of orders received in recent months. Some of the orders call for extensive shipments, but perhaps the majority are for the usual quantities. So far the trade are buying spring and summer goods, such as Screen Doors, Wire Cloth, Ice Cream Freezers and Refrigerators, quite freely. In other respects orders indicate a need for the general line of Hardware. Representatives have very generally posted up and are again in their respective fields. No cutting down has been noted in the number of traveling men; on the contrary, a disposition is shown to have the territories worked even more closely than ever. The Heavy Hardware jobbers report prospects for the present year's business as exceedingly bright. Inquiries for goods are very strong and a heavy demand is expected to result therefrom. The Southern market is still buying Trace Chains, for which the call has recently been very pronounced.

## Notes on Prices.

**Wire Nails.**—The current demand for Wire Nails has fallen off during stock taking and the annual settling up of last year's business. Orders are being booked for January and February delivery. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

**New York.**—Local requirements are light, with prospects of an increased demand in the future. Prices are as follows:

To retailers, carloads on dock.....	\$2.48
Small lots at store.....	2.55

**Chicago, by Telegraph.**—After a brief quiet period at the opening of the year the demand for Wire Nails has increased materially. Excellent orders are now being received by manufacturers. No change in factory prices has been made, but irregularities in freight rates have been revised, which make slight advances at some receiving points. Indications are in favor of the maintenance of present prices, as the manufacturers have so many orders on their books that they can easily hold their position until the opening of spring trade. Jobbers report quite a good demand from store, considering the time of the year. Carload lots are quoted at \$2.35, with the usual advance for small lots.

**St. Louis.**—The trade have only the best reports of the Wire Nail market. The demand shows no radical change, continuing in very good force. Price is \$2.40, base, in carloads to retailers; \$2.45, base, for smaller lots.

**Pittsburgh.**—The Wire Nail market is unchanged. There is a fair demand, but no change in prices. We quote, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

**Cut Nails.**—The Cut Nail market is devoid of new features. Demand is moderate at former quotations, which are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$1.95
To jobbers in less than carload lots.....	2.00
To retailers in less than carload lots.....	2.10

**New York.**—Cut Nails are receiving their proportion of orders, which is light at this season. Prices remain unchanged, as follows:

To jobbers in carload lots on dock.....	\$2.13
To jobbers in less than carload lots on dock.....	2.18
To retailers in less than carload lots on dock.....	2.31
Small lots from store.....	2.25

**Chicago, by Telegraph.**—Jobbers are having a fair demand for Cut Nails, and are holding small lots from stock unchanged at \$2.25.

**St. Louis.**—The Cut Nail market is featureless. Buying is of uniform nature. Price continues \$2.30 to \$2.40, base.

**Pittsburgh.**—There is a fair demand for Cut Nails, and prices are unchanged. We quote f.o.b. Pittsburgh, terms 60 days, 2 per cent. off in 10 days, as follows: Carload lots, \$1.95; jobbers, less than carload lots, \$2.

**Barb Wire.**—Requirements for Barb Wire are larger than last week, but not up to the previous demand. The outlook for distribution in the spring is encouraging. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....	\$2.50
To jobbers in carload lots, Galvanized.....	2.80
To jobbers in less than carload lots, Painted.....	2.55
To jobbers in less than carload lots, Galvanized....	2.85
To retailers in carload lots, Painted.....	2.60
To retailers in carload lots, Galvanized.....	2.90
To retailers in less than carload lots, Painted.....	2.70
To retailers in less than carload lots, Galvanized....	3.00

Ellwood and Baker Wire is 5 cents and Washburn & Moen Glidden 10 cents per 100 higher than the foregoing prices.

**Chicago, by Telegraph.**—Renewed buying is reported in Barb Wire following a brief period of dullness at the opening of the year. Jobbers are having a moderate demand from stock, which is, however, better than usual at this season. Quotations are unchanged at \$2.70 for small lots of Painted and \$3 for Galvanized Wire from stock, with the usual reduction on carload lots.

**St. Louis.**—The very good reports made by the trade during the past week concerning Barb Wire still apply. Buying is of an excellent character. Painted is \$2.70 in carloads to retailers; smaller quantities, \$2.75. Galvanized is 30 cents higher.

**Pittsburgh.**—There is a moderate demand for Barb Wire, which is expected to increase in the spring. In certain sections the demand for Barb Wire is heavier than usual at this season of the year. For domestic trade we quote: Galvanized Barb Wire, \$2.80, in carload lots to jobbers, and Painted, \$2.50. Terms 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

**Plain Wire.**—The distribution of Plain Wire is in fair volume. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in ten days:

Base sizes.		
	Plain.	Galv.
To jobbers in carload lots.....	\$2.15	\$2.55
To jobbers in less than carload lots.....	2.20	2.60
To retailers in carload lots.....	2.25	2.65
To retailers in less than carload lots.....	2.35	2.75

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the advances indicated in the following table:

*Plain Fence Wire Advances (Catch Weights).*

Nos.	Base	Galvanized.
6 to 9.....	Base	\$0.40 extra.
10.....	\$0.05 advance over base	.40 "
11.....	.10 " " " "	.40 "
12 and 12½.....	.15 " " " "	.40 "
13.....	.25 " " " "	.40 "
14.....	.35 " " " "	.40 "
15.....	.45 " " " "	.75 "
16.....	.55 " " " "	.75 "
17.....	.70 " " " "	1.00 "
18.....	.85 " " " "	1.00 "

For even weight bundles, 50 pounds or over, 5 cents per bundle advance on above.

*Chicago, by Telegraph.*—A fair volume of business is being enjoyed by both manufacturers and jobbers in Plain Wire. Small lots, Chicago delivery, are quoted at \$2.35, base.

*Pittsburgh.*—Manufacturers and jobbers report an active business in Plain Wire, which is expected to materially increase in the spring. We quote:

	Plain.
To jobbers in carload lots.....	\$2.15
To jobbers in less than carload lots.....	2.20
To retailers in carload lots.....	2.25
To retailers in less than carload lots.....	2.35
Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. discount allowed for cash if paid in 10 days from date of invoice.	

**Ship Augers and Bits.**—In the manufacturers' list on Ship Augers and Bits which was given in our issue 20th ult. there was an error in two sizes, and we accordingly reprint the list below in its correct form. The discounts are, as stated, 15 and 10 per cent. on L'Hommedieu's and 40 per cent. on Snell's, Watrous' and Ford's:

<i>Ship Augers, With or Without Screws.</i>			
Sizes.	Per dozen.	Sizes.	Per dozen.
4-8 inch and under.....	\$7.50	16½ and 17-8 inch.....	\$57.00
4½ " 5-8 inch.....	9.00	17½ " 18-8 ".....	72.00
5½ " 6-8 ".....	10.50	18½ " 19-8 ".....	86.00
6½ " 7-8 ".....	12.00	19½ " 20-8 ".....	101.00
7½ " 8-8 ".....	13.50	20½ " 21-8 ".....	115.00
8½ " 9-8 ".....	15.00	21½ " 22-8 ".....	130.00
9½ " 10-8 ".....	16.50	22½ " 23-8 ".....	144.00
10½ " 11-8 ".....	18.00	23½ " 24-8 ".....	158.00
11½ " 12-8 ".....	21.00	24½ " 25-8 ".....	187.00
12½ " 13-8 ".....	24.00	25½ " 26-8 ".....	216.00
13½ " 14-8 ".....	25.50	26½ " 28-8 ".....	245.00
14½ " 15-8 ".....	31.50	27½ " 30-8 ".....	274.00
15½ " 16-8 ".....	38.00	28½ " 32-8 ".....	330.00

*Ship Auger Bits. With or Without Screws.*

1-8	4½	5½	6½	7½	8½	9½ and to 4-8
and 5	and 6	and 7	and 8	and 9	10-8ths inch.	
\$6.00	7.50	9.00	10.50	12.00	13.50	15.00 per doz.

In Sets of Bits, 32½ quaters, one each from 2 to 8-8ths inch, in plain boxes, per set, \$9.00.

**Binder Twine.**—There has been little interest taken by buyers in Binder Twine so far this year, and inquiries have resulted in a limited business. A lack of uniformity in prices characterizes the Eastern market, quotations apparently being tentative. The Manila hemp market, it appears, is being manipulated. Should the burden become too great for those who are attempting to control, a drop in prices is expected. There are rumors that some manufacturers are guaranteeing prices, and reports are to the effect that Binder manufacturers in the West are securing promises of customers' Twine orders without naming definite figures. There was some Twine carried over by manufacturers, and in sections where the wheat crop was a partial failure dealers had considerable Twine left on their hands. General quotations are as follows for small lots of Twine, with a rebate of ¼ cent per pound for carload lots, f.o.b. Eastern factory:

White Sisal, 500 feet per pound.....	7¼ to 7½c.
Standard, 500 feet per pound.....	7¼ to 7½c.
Manilla, 600 feet per pound.....	9 to 9¼c.
Pure Manilla, 650 feet per pound.....	10½c.

One Eastern manufacturer quotes small lots of Sisal and Standard Twine at 7¼ cents; Manilla at 9¼ cents, and Pure Manilla at 10½ cents, f.o.b. Chicago, with ¼ cent rebate in carload lots.

**Horseshoes.**—Practically all the manufacturers of Horseshoes, except the Burden Iron Company, have formed a strong organization and established uniform prices which embody something of an advance. The new prices are based upon quotations, f.o.b. Pittsburgh, to which the freight to destination is to be added. The new prices are as follows for carload lots: Iron Horseshoes, \$3.50 per keg; Steel Horseshoes, \$3.25 per keg. On carload lots freight to destination at the carload rate is to be added to above prices. On less than carload lots 5 cents per keg is to be added to these prices and freight at less than carload rate to destination. A rebate of 15 cents per keg is to be given to purchasers of 2000 kegs during the year.

**Cordage.**—Conditions in the Rope market have undergone no change during the past two weeks. Business is comparatively light and is for immediate requirements. The hemp market is apparently in strong hands at present, and at the prices ruling manufacturers are buying only for present needs. Manila Rope is quoted on a basis of 7-16 inch and larger at 9¼ to 10 cents per pound, and Sisal, on the same basis, at 6¼ to 7 cents.

**Glass.**—No announcement has been made of prices by either the American Window Glass Company or the Independent Glass Company, although it is expected soon. When it does come it will probably be in the nature of an advance. Little Glass is changing hands and former quotations rule as follows: For carload lots jobbers quote manufacturers' prices, with 5 per cent. added. Discounts for small lots from the jobbers' list of September 1, which are uniform over the entire country, are as follows:

All single strength.....	85 and 25 %
All double strength.....	85 and 25 and 5 %

**Paints and Colors.**—Leads.—The immediate demand for White Lead in Oil is naturally light during the month of January. Manufacturers are making preparations to supply requirements for the coming season, which are promising. Quotations are unchanged, as follows: In lots of 500 pounds and over, 6½ cents per pound; in lots of less than 500 pounds, 7 cents per pound.

**Oils.**—*Linseed Oil.*—The weakness in the Linseed Oil market resulted in a reduction of prices by manufacturers to 56 cents per gallon for City Raw in lots of five barrels or more, and 57 cents in lots of less than five barrels. State and Western brands are held at 53 and 56 cents per gallon by different interests. It is claimed that 53-cent Oil entails a loss upon crushers. Demand is confined to small lots. Large buyers are holding off for lower figures, while crushers are not anxious to fill orders at the lower price.

**Spirits Turpentine.**—The market has advanced 1¼ cents during the week. Turpentine is quoted at this point at 40 cents for Southern and 40½ cents for machine made barrels. Demand is for small lots, large buyers not finding present quotations attractive, while holders refuse to name lower figures.

**Request for Catalogues, &c.**

**D.** QUINLAN & SON, who are dealers in Hardware, Groceries and General Merchandise, Jamesville, N. Y., request catalogues and quotations from the trade pertaining to Harness, Trunks, &c.

THE McCaffrey File Company of Philadelphia have completed an extensive addition to their two-story buildings. The new engine house has also been finished and they are now installing a 500 horse-power engine, so as to give them sufficient motive power to enable them to fill more promptly not only their domestic trade, but also their export orders, which have attained a large volume.

A RECENT issue of the Nashville American contains a eulogistic article concerning B. W. Haverfield, the artistic window dresser of the Gray & Dudley Hardware Company of that city. Mr. Haverfield has a deservedly high reputation in this line, and the good taste and artistic skill which always characterize his work have called forth many expressions of admiration.



## The Export Trade.

The following table shows the exports of domestic merchandise from the United States and the United Kingdom, respectively, in each calendar year from 1875 to 1899 inclusive, and eleven months of the year 1900:

Exports of Domestic Merchandise from—		
Calendar year.	United States.	United Kingdom.
1875.....	\$497,263,737	\$1,087,497,000
1876.....	575,735,804	976,410,000
1877.....	607,566,495	967,913,000
1878.....	723,286,821	938,500,000
1879.....	754,656,755	932,090,000
1880.....	875,564,075	1,085,521,000
1881.....	814,162,951	1,138,873,000
1882.....	749,911,309	1,175,099,000
1883.....	777,523,718	1,166,982,000
1884.....	733,768,764	1,134,016,000
1885.....	673,593,506	1,037,124,000
1886.....	699,519,430	1,035,226,000
1887.....	703,319,692	1,079,944,000
1888.....	679,597,477	1,141,365,000
1889.....	814,154,864	1,211,442,000
1890.....	845,999,603	1,282,474,000
1891.....	957,333,551	1,203,169,000
1892.....	923,237,315	1,105,747,000
1893.....	854,709,454	1,062,162,000
1894.....	807,312,116	1,051,193,000
1895.....	807,742,415	1,100,452,000
1896.....	986,830,080	1,168,671,000
1897.....	1,079,834,296	1,139,882,000
1898.....	1,233,564,828	1,135,642,000
1899.....	1,253,486,000	1,287,971,039
*1900.....	1,308,913,789	1,303,440,000

\*Eleven months.

One of the greatest exporting concerns in existence, in referring to the trade of the past year, call attention to the fact that trade in metals is peculiarly satisfactory to American manufacturers, particularly among the larger organizations, who are credited with having handled the traffic with much ability. These concerns have not only made lower prices than their foreign competitors, but have kept prices near enough to foreign prices so that profits have not unnecessarily been thrown away. In former periods a manufacturer with a surplus product would sell abroad at almost any figure. At present manufacturers are getting for their goods exported, in a great many instances, nearly as much as for domestic trade, and in some cases more. A prominent export merchant refers to the foreign demand for Steel Rails as continuing important, and Germany, England and Belgium are alluded to as "panic stricken," and manufacturers in those countries cutting prices deeply with a view to retaining their grip on the trade and regaining what has been lost to American producers. The export trade of England in metals has not shown its old profits, while the volume is fairly good. All these countries are struggling to keep manufacturers in the United States from making further inroads on their trade and, we are told, are sacrificing their profits to this end. Our successes have been marked in the German, English and such markets as Asia, Australasia, South Africa and South America.

Another well-known export house, whose trade is widely extended, in discussing the business of the past year, say there have been exceptionally brisk shipments of all sorts of merchandise, and particularly goods constructed from iron and steel. Foreigners have waked up to the fact that their wants can be supplied here, preferring to send their orders to this country rather than to Europe, all things being equal. The financiers of the world are more and more recognizing New York as the great money center, and increasing attention is being paid to the United States and what it produces. It is this company's experience that many foreign buyers come here now instead of going directly to Europe, or else pass through the United States on their way to Europe, where formerly they did not. They find they can supply their wants to better advantage than in the older markets. One instance quoted as a type alluded to a buyer from South America who journeyed to France to place orders for Electrical Goods. Returning this way he found the same merchandise could be duplicated

in the United States at 15 to 20 per cent. less than his Continental purchases, already made, and his next orders will be placed here.

Trade with Cuba and Porto Rico in the past year is referred to by a prominent house in that trade as rather flat. With this crop, however, it promises to be much better. The trouble with Cuba the last year has been that the sugar crop was small, aggregating, it is said, somewhere in the neighborhood of 200,000 tons of raw sugar. It is anticipated that this year's crop will amount to about 600,000 tons. Planters will be able to pay some of their back bills and thus increase their line of credit and be in position to take more goods. In Porto Rico the coffee crop was poor and the price dropped a few points, resulting in slow collections. Most of the traffic with Cuba this year has been in the way of public improvements, such as public buildings, roads, private asylums, and the various betterments which have been carried forward there under the auspices of the United States Government.

Trade in South Africa during the past year has been hampered by the war, the principal business there having been largely in cereals, horses, mules, hay, feed and munitions of war, which have compensated for the loss of trade in other channels. As soon as a normal condition is reached later a good business along old lines will be done again in that market.

Flint, Eddy & American Trading Company, now occupying several floors in the Johnston Building, 30 Broad street, New York, will, about May 1 next, move across the street into the Broad-Exchange Building, now in course of erection. The expansion of their business has compelled them to greatly enlarge their office facilities. They will occupy the entire nineteenth floor and a portion of the eighteenth floor, giving them in all about 30,000 square feet of floor space for themselves and allied interests. The object of this change is to get their various departments in as compact form as possible on two floors of what is said to be the largest office building in the world, where they are now scattered through six different floors at their present address, which in itself is one of the most recent modern office buildings down town.

C. K. Turner & Son, 76 Broad street, New York, direct representatives of American manufacturers for export, in addition to those they have acted for in the past, have recently been appointed sole export agents for the following concerns: Myers & Ervien Company, Ogontz, Pa., manufacturing Hay, Manure, Spading, Sluice, Tanners, Coke, Coal, Charcoal, Oyster and other Forks of this character; Smith Harper, Philadelphia, Pa., manufacturing a full line of Hoes, Garden Rakes, &c., and Chadborn & Coldwell Mfg. Company, Newburg, N. Y., manufacturers of Lawn Mowers, both for hand and horse power. This makes a total of 35 American manufacturers directly represented by this house for export business, which is only solicited from buyers in New York for foreign markets.

McCabe Hanger Mfg. Company, 532-542 West Twenty-second street, New York, refer to their success in the past year in getting trade from foreign countries for the Parlor Door Hangers they manufacture. We are informed that they are now shipping goods of this character to England, Scotland, Germany, France, Australia, Norway and Sweden, and a few days ago were requested to send samples to the engineering department of the Russian-Siberian Railroad, suitable for use in connection with railway construction.

Springfield Hardware Company have succeeded J. H. Buckle in the Hardware, Stove and Sporting Goods business in Springfield, S. D., and will continue the wholesale and retail business. The firm are composed of S. M. Brann, H. M. Davison and August Manksch. They have added a complete line of Pipe and Plumbing Goods and Wind Mills, and will do all kinds of plumbing and pump work.



## Cultivating English Trade.

**J**OHAN L. SARDY, Saracen Chambers, Snowhill, London, E. C., England, the representative of well-known American manufacturers, is at present in New York. In a recent conversation Mr. Sardy referred to the promising outlook for American Hardware in England and the possibility of direct dealings between manufacturers in this country and the English trade. On this subject Mr. Sardy's views are entitled to weight in view of his residence in London for the past five years, and his familiarity with foreign trade, which was acquired during a year and a half spent in visiting the commercial centers in the Hawaiian Islands, New Zealand, Australia, Java, India, China and Japan. In regard to the English market and the way to cultivate it, Mr. Sardy in a recent interview with a representative of this journal said:

### Field for American Manufacturers.

The field for American manufactured goods in Great Britain and abroad is almost unlimited, a fact which American manufacturers are realizing, but certainly not to the full extent it deserves. The great home market in the United States naturally receives first consideration, but the rapid increase and in many cases overproduction of American manufactures makes a foreign market more important year by year. English and German activity in seeking export business is decidedly more pronounced than American and usually more intelligently carried on.

### Representation Abroad

Many American firms are not represented abroad, some are partly represented, and some think they are represented. Of the latter class, I instance the case of a firm in the United States to whom I wrote not long since with a view to acting as their agent in Great Britain, knowing that their goods would sell there. In reply the firm informed me they could not negotiate for Great Britain, as they were selling exclusively to a firm in Glasgow. In other words, this firm were satisfied with a single customer, and that one a dealer, not an agent, a situation which I venture to think would not suit them in their own market, and would not be the case in Great Britain if they employed an active and intelligent agent, who would not be satisfied with merely a local Glasgow trade, but would see that their goods were properly marketed throughout Great Britain and the colonies.

In another case a well-known American Hardware company declined a proposal to act for them in London on the grounds that they were already represented, giving the name of the firm, little knowing it was a small retail Hardware concern, and, of course, totally unsuited to represent a manufacturer. A third company could not make any arrangement, as they were represented by Mr. So and So of London, whereas Mr. So and So happens to have no office whatever in London, but is merely a traveling salesman, residing in another city.

### Three Methods.

There are three methods open to the American manufacturer to secure foreign business, one being through responsible export commission houses, to whom all praise is due for their well directed efforts in developing American export trade. Should this course not appeal to the manufacturer desiring a more direct control over his foreign business, he must either open his own establishment abroad or arrange with a *bona fide* agent to represent him. In most cases the expenses of an establishment would be too heavy in proportion to the profits and result in loss, consequently the employment of an agent not representing too many other interests is really the safer course of the two, as arrangements can be made whereby the manufacturer cannot suffer any loss, and at the same time keep the business under his own control.

### Misapplied Energy

The push and energy displayed at home in seeking business are out of place in England. Our British cousins like to do things in their own way and do not propose to be hurried about it. The active American

salesman, arriving in London with the idea of staying a week or two and incidentally taking a few orders, had better remain at home. To succeed requires patience, tact and money, one being useless without the others. Aggressive methods are not liked. The British merchant surrounds himself with barriers in the shape of office boys, clerks and such like defenders of his sacred person, seemingly with the idea of making it as difficult as possible to do business with him. He trades after his own fashion, as his father and grandfather did before him, and it is simply lost time to try to change his methods.

### "Stooping to Conquer."

There have been instances where American representatives coming to London for business have taken orders, agreeing to give the sole sale to the firm buying, and subsequently accepting orders for the same line from other firms. John Bull does not like this and is somewhat chary about doing business with American travelers. He prefers to deal with a reliable, resident agent, actually in the employ of the manufacturer he represents, knowing that he is not paying the agent a farthing more than the manufacturer's price. In other words, the American manufacturer, who really desires to establish a solid and profitable trade in Great Britain should be prepared to do so on English lines, otherwise he had better leave it alone.

### Domestic vs. Foreign Methods.

In the United States an Eastern manufacturer does not hesitate to appoint an agent, say in San Francisco, or to send his traveler there, paying the expenses, and yet the moment the same manufacturer is approached with an agency proposal for London, he shakes his head and says he will be glad to sell his goods, f.o.b. New York, for cash, but does not see his way to appoint a London agent, and yet London is no further away from New York than is San Francisco. The business is certainly quite as safe and the opportunities for orders far and away greater, but just because it happens to be out of the United States the manufacturer has his doubts, whereas the English merchant, who understands export business better than any trader in the world, does not doubt, but goes ahead and gets the business.

There are to-day in the United States many lines of goods only partly introduced in England, or not there at all, which can be successfully put on the market. It only needs more confidence, and, I may add, common sense on the part of the American manufacturer to secure this trade. As an instance, about two years ago an American gentleman came to London for his health and incidentally brought with him a few samples of goods made by the company he was connected with. Similar goods were made in England and Germany, but had never before been shipped to Great Britain from the United States. After resting a while, this gentleman found his health sufficiently improved to permit him to look about and see if there were any chances for business. One of the first firms he called upon were customers of mine, and after the samples had been shown the head of the firm inquired if a permanent agent had been appointed in London, to which the gentleman, who was there for his health, answered in the negative and asked if he should have one. He was informed that was the usual English custom, and the head of the firm, remembering that I was an American agent, was good enough to give him my address. Within 24 hours we came to an agreement and to-day that American company are doing a profitable and steadily growing trade in England.

### America's Opportunity.

England, as the former workshop for the world, naturally feels disturbed at the changes which have taken place in recent years, changes largely due to the British workman, who has encompassed himself with labor laws and other ingenious devices calculated to hamper production, and this to such an extent that he may be considered the American manufacturer's best friend. In England American goods are looked upon with more favor and less like manufactures from a foreign country than other importations. The method

of packing excites admiration and the ingenious and novel construction of the goods is looked upon with general favor.

Let the American manufacturer study more carefully the best methods of placing his goods on a foreign market, and with his great ability in manufacturing he will one day find himself in control of an export trade of such importance that when hard times come he can still keep his factory running and pity his rival, who was too busy or indifferent in good times to bother about orders outside the great American Union.

### British Letter.

FROM A SPECIAL CORRESPONDENT.

**A**LFRED FIELD & CO., Birmingham, England, the American branch of whom is at 93 Chambers street, New York have opened London showrooms at Saracen House, Snowhill, London, E. C. The head office is at Birmingham, and they have another establishment at Sheffield. They have appointed as their London representative Albert Newman, who is very well known throughout the London trade, and should therefore be in a position to sell American goods in useful quantities.

#### American Hardware.

I looked round the showroom the other day and found an interesting assortment of American Hardware, among which ball bearing Lawn Mowers were prominent, and I was informed that already large contracts had been made for the coming season. It did not require the assurance of Alfred Field & Co.'s representative for me to know that American Lawn Mowers are growing in popularity. They are light and cheap. They have, however, as a general rule, one fault, and that is the blade is too high. English lawns are much smoother than American lawns, and the consequence is that the cutters might well be let down  $\frac{1}{4}$  inch. I also saw Egg Beaters, Mincers, Door Locks, Mouse Traps, Cycle Lamps and a quantity of smaller American Hardware. A large supply of Wood Handles of all descriptions was on show. Mr. Newman informed me that he could sell Wood Handles with the greatest possible ease. I recommend any Americans coming to London to look up Alfred Field & Co. at the above address.

#### American Competition in the Bahamas.

It is satisfactory to know that the Bahamas are in quite a flourishing condition. The official revenue has risen 40 per cent. Formerly British Hardware exporters held the trade, but the United States year by year are capturing it for themselves. This is seen by the following figures, in which is shown a comparison of the trade done by Great Britain and the United States:

	1899.		1898.	
	United States.	United Kingdom.	United States.	United Kingdom.
Earthenware, Glassware, Furniture .....	£27,463	£5,495	£26,512	£6,137
Tinware, Hardware, &c. . . . .	4,875	1,906	7,199	1,986

I have recently had an opportunity of discussing the prospects of American trade in the Bahamas with a Government official who has given considerable attention to the question, and he informs me that the trade is bound ultimately to go to America. He says there is a growing trade and that it is well worth cultivating.

#### Wire Work Not Hardware.

There are three or four American Wire Work manufacturers who are sending Bird Cages over here. Some of these Bird Cages from America which I have seen are wonderfully elaborate pieces of work. The competition is, I believe, keen, but I know that one or two American houses with whom I have been in communication are increasing their trade. Then there are some Wire Work Mouse Traps and Rat Traps also coming from America. I recommend any such manufacturers to consign in future as much as possible direct to London, if their warehouses be in London, because the railway companies have now decided that Bird Cages are not Hardware and the railway freight has been accordingly increased. In so far as the trade is a London trade

it should be consigned by London steamers so as to save the increased cost of carriage. It might make all the difference between winning or losing the trade.

#### The New German Customs Tariff.

English Steel manufacturers and Hardware merchants are just now concerned with the proposed new German customs tariff which, so far as Great Britain is concerned, comes into operation next year. There is undoubtedly a movement in Germany to exclude various Steel and Hardware goods—really, I believe, designed to keep out English manufactures. As America stands in precisely the same position as Great Britain it would be a good thing if American and British Hardware Metal exporters were to come to some understanding and make united representations to the German Chancellery. Seebohm & Dieckstahl, the well-known Steel and Cutlery firm of Sheffield, are interesting themselves in the matter, and no doubt would be glad to hear the views of any American firms interested. The trade as between Great Britain and Germany in the staple Hardware lines is as follows:

	—Export to Germany.—		—Import from Germany.—	
	Tons.	Value.	Tons.	Value.
Wire Nails. . . . .	....	....	13,253	£115,000
Nails. . . . .	....	....	21,394	130,000
Iron Wire. . . . .	2,439	£4,500	30,408	245,000
Finished Hardware. . . . .	433	50,000	3,252	325,000
Rough. . . . .	7,497	285,000	12,206	490,000

Pig Iron was exported to Germany to the amount of 529,770 tons, value £1,720,000. Import, none. Wrought Iron in bars, 7491 tons; value, £70,000. Import, none. In this case what hits Great Britain hits America, as I take it the most favored nation clause treaty will operate in any event.

#### From an Australian Correspondent.

**B**Y the time this paper reaches New York the Australian Commonwealth will have come into being. At midnight on December 31 the existing conditions of six different States will cease to be, and a United Australia will greet the new century.

#### The Australian Tariff.

The Governor-General will be sworn in on January 1, the Federal Parliament will meet about April, and the tariff will be the first subject to be grappled with. *The Iron Age*, nearly 12 months ago, foreshadowed an average all round tariff of 20 per cent., and there is no apparent reason for altering views then expressed now.

**REVENUE TARIFF.**—This would be practically a revenue tariff—not too high to stop imports from the United States and other countries, and so kill revenue, nor yet so low as to prevent the existing customs revenue of the six colonies, about £7,500,000, from being available.

The Chambers of Manufacturers of the different colonies have been in conference in Sydney, and their suggestions will no doubt carry some weight.

**PREFERENTIAL DUTIES.**—The subject of 10 per cent. preferential duties on British imports was considered, but hardly found favor. American manufacturers are scarcely likely to be handicapped with such restrictions, although the matter will certainly cause hot discussion in the Senate. The policy of a preferential tariff in favor of British made goods would undoubtedly leap into popular favor at once if England would reciprocate by protecting Australian produce in the home market as against the Argentine Republic, whose exports of wool, frozen meat, cattle and horses to the English market compete strongly and compare favorably with our exports in these lines. And the chief trouble is that the South American republic, with its comparative nearness to Europe, its more suitable climate and its cheap labor, finds more favor in the sight of capitalists, and consequently bids fair to develop more rapidly. Sentiment cannot be altogether ignored, even in business, and Great Britain may yet find it necessary to help her dependencies in the above way.

#### Trade Conditions.

Trade generally throughout the colonies is continuing to show signs of steady expansion. Engineering



shops are keeping in full work, both on new business and repairs. In New Zealand especially is this trade very brisk.

Railway developments are proceeding steadily and several private railway bills are in hand in different colonies.

Railway development, or, in other words, the facilities for dispatching and receiving, may be said to be the keynote of progress so far as Australia is concerned. The light 60-pound rails in general use are being gradually replaced by heavier ones, to meet the increasing traffic.

#### National Association of Master Plumbers of Australia.

A meeting of delegates from the different associations of master plumbers in each colony was held in Melbourne during the early part of November, as the result of which the above named association was formed with the object of putting the plumbing trade of Australia on a proper footing and carrying out sundry reforms in the way of making the trade more profitable and sound. As the result of several days' solid work the convention drafted the rules and by-laws of a constitution, to be submitted to the trade throughout Australia, and, it is hoped, finally confirmed at a second conference to be held in the city of Sydney, at Easter, 1901. The Melbourne section of the trade have for some considerable time past been very sore on the subject of what they regard as the unfair competition of the Melbourne Board of Works, a body holding vested power from Parliament to conduct and carry through the huge sanitation scheme now in progress. This body, working on public money, by buying largely can undercut the plumbing trade, and as a result plumbers claim to have various grievances against them.

It is hoped that the National Association of Plumbers, in whose minds the successful workings of the American association have for some time past served as an object lesson, will do much to minimize present trade difficulties.

#### Western Washington Hardware Association.

WE are indebted to C. W. J. Reckers, secretary of the Western Washington Hardware Association, for the following advices in regard to the work accomplished since its organization in April last:

The Western Washington Hardware Association is yet too young to have accomplished much work besides getting organized. We have only been in existence since last April, but the association is a pretty healthy infant. Our work is only begun, but there is plenty of it ahead of us. The questions we have to handle are similar to those engaging the attention of the old Hardware associations in the East—namely, the jobbers who are doing a retail business, the merchants in Selling Hardware other lines of business who sell Hardware as a bait to draw customers to their legitimate line, and last, but not least, the legitimate Hardware dealer who does business simply for the fun of selling something and does not care particularly whether there is a profit in it or not.

Our members are enthusiastic regarding the progress we have made. We can all see the association has brought us closer together, and that we have a better understanding with each other and with the jobbers, also that we get broader and better views of these complex trade questions than we have had before.

We expect the year 1901 will show marked improvement in some of the questions we are trying to solve as a result of the association work.

#### Missouri Retail Stove and Hardware Dealers' Association.

The Executive Committee of the Missouri Retail Stove and Hardware Dealers' Association met at Kansas City, December 20, and arranged for the annual con-

vention to be held at the Coates House, Kansas City, February 19, 20 and 21, 1901.

Reduced railroad rates have been secured as well as special hotel rates. E. Thomas, Trenton, Mo., is secretary of the association. It is expected that the convention will be generously attended.

#### Death of Frank Shapleigh.

BRIEF reference was made in these columns last week to the death, on the night of January 1, of Frank Shapleigh, first vice-president and general manager of the A. F. Shapleigh Hardware Company, St. Louis. Mr. Shapleigh was born in Philadelphia in 1838. In 1843 his father, A. F. Shapleigh, now in his ninety-second year, took his family to St. Louis, having been commissioned by the Philadelphia hardware firm of Rogers, Field & Co. to open a St. Louis house for them. Frank Shapleigh received his education at the Wyman Institute, St. Louis, and also at a private school located at Hermann, Mo. In 1856 he entered the service of Shapleigh, Day & Co., successors of Rogers, Field & Co., as office



FRANK SHAPLEIGH.

boy. From that humble position he advanced by successive stages to the office of first vice-president and general manager, held at the time of his demise.

Mr. Shapleigh always took an earnest interest in such measures as gave promise of benefit to the trade. He was one of the few men who launched the National Hardware Association in Cleveland in 1894. He kept in touch with local business affairs, was a member of the Merchants' Exchange, the Business Men's League and of several clubs in St. Louis. In June, 1865, he married Miss Mary Daggett, daughter of Mayor John Daggett of St. Louis, who survives him; no children were born to them.

His interest in his fellow man is referred to by those who knew him well. In an unostentatious manner he gave encouraging advice to those who sought his counsel, coupling it with material aid where he felt it was needed. Of a modest and retiring disposition, he nevertheless greeted with uniform courtesy and consideration all with whom he came in contact, no matter how humble their calling. He was particularly a favorite of the many representatives of manufacturers who visited St. Louis, who were endeared to him through his kindly character. Few men had more friends among the factory representatives than had he or whose death will be more sincerely regretted. A tribute from his associates is that he always maintained a placid and unruffled demeanor, expressions of impatience or irritation being foreign to his nature.

Four brothers and one sister survive him—Alfred L.,



secretary, and Richard W., second vice-president of the A. F. Shapleigh Hardware Company; A. F. Shapleigh, Jr., Dr. J. B. Shapleigh and Mrs. J. Will Boyd.

The pall bearers at the funeral were John Cantwell, a former partner; Charles Fach, for many years in the company's service, but now retired, and the following active employees who have been longest with the house: Robert A. Pendleton, J. E. McBeth, Henry Garlich, Albert Slevin, John O. Goldsmith and Clarence B. Beck.

## The Old Year and the New in Hardware.

BY H. C. W.

**J**ANUARY, of all months of the year, is the most vital one to the man in business; vital in that it is the stopping and starting point with many, the point at which they review the 12 months just past for results, be they good or bad. Few merchants are content to plod along in a rut year after year, with no appreciable growth in the business, no increase in the profits, no outlook for anything better than that which has gone before. If the year has been one of loss, or without profit, then it becomes a necessity to look things squarely in the face and see what is wrong.

### The Year 1900

should compare very favorably for all of us with other years. It has been one requiring much of care and watchfulness as to stocks and buying, and it is not fair to put it in comparison with that of 1899, in which large speculative profits fell to the lot of the Hardware merchant for the time being. The extreme prices ruling during that year and the resulting heavy buying in anticipation, as a rule, made very careful purchasing for 1900. As far as known the merchants of Ohio—the retailers in particular—will come to the January mile post showing a safe year's business and an average of profits.

There have been fewer failures than for many years. There is great confidence, merchants have done less borrowing in this section than in years gone by, bills are paid more promptly, money is freely spent, additions and enlargements are being made on every hand, and all that tends toward prosperity shows on the face of the year's work. In talking with numerous merchants over the State the impression prevails that the year has been a good one—better than the average, and will compare more than favorably with other years.

### The Community's Prosperity

is in evidence everywhere and on all sides. The farmer and the citizen both have money and are spending it. They are paying old accounts and asking for but little in the way of new ones. 'Way back accounts, long since given up, have come in to many merchants. As a general or usual experience I venture the assertion, too, that the cash sales of most merchants make a better daily showing for 1900 than for years before.

People are spending their money at home, not in adjoining cities—an evidence of contentment and prosperity. Throughout our State the wheat crop, on which so much depends, was a failure, but other crops were very large, evening up the ready money for the farmer. We hear much less of the catalogue house than in close or hard times. The records show more mortgages canceled than for any one of many years past. Such conditions do not stand in and for hard times, nor do they exist in any other than a prosperous season; and yet there are always merchants, with or without cause, ready to complain of the

### Hindrances to a Retail Merchant's Success,

surrounded as they may be by all that goes to show satisfaction, contentment and prosperity. It is true beyond any doubt that with this class of people the trouble is largely of their own making. The causes can be easily pointed out. Present methods of doing business are such that no man can for an instant afford to neglect that which is his own, feeling secure in the fact that his is an old house, that everybody knows him and his location, that he has had the trade heretofore and will still hold it, that the farmer, mechanic and contractor cannot possibly get along without him.

Advertising is expensive. He drops it or perhaps is one of the many Hardware merchants who has never indulged in it. Some enterprising young fellow settles down along side of him, who knows the value of printer's ink and who rapidly draws his trade a few steps further on. He may have grumbled all the good out of his employees so that they lose interest and customers at the same time. Perhaps his show windows have gone astray for lack of attention.

Let him pull himself together, get in with the cheerful, progressive people of the world, those who are helping to keep with us the prosperity that certainly should be ours for the few years in sight.

### Outlook for 1901

It seems a bright, prosperous one from any standpoint, and it does look as though the time for the growing business man was at hand. There are very many reasons why 1901 should be a great year in the Hardware trade. The two or three years but just ended have made a class of careful, judicious buyers. The experience has been one we may wait the better part of a life time to go through again. The lessons have been particularly taken to heart by the younger merchant and buyer. Money is easy and readily gotten at extremely low rates of interest. Contentment is in the lap of every man who works. Everybody has a good word to say for everybody else and everything. Merchandise has reached a fairly settled basis of prices. More cash and less credit is the rule, which to a young man in business is everything. We have no election to contend with for another four years, and the result of the one just through with is such that men of all parties are at least content to accept it as satisfactory.

### The Formation of Local and State Associations

in many sections is of untold benefit, the balance wheels of the country are running smoothly, and no element of speculation enters into our everyday life. With all these things before us, with the general good feeling existing, why should not the 12 months of 1901 be full of busy, happy and prosperous merchandizing? We can make them what we will.

## Exhibition of Cycles, Motor Cycles and Automobiles.

**U**NDER the auspices of the National Cycle Exhibition Company there will be a show of Cycles, Motor Cycles, Automobiles and Accessories at Madison Square Garden, from Saturday, January 12, until Saturday, the 19th, inclusive. It will make the inventions that are improvements over previous years familiar to the buyers and riders of the best wheels. The manufacturers have put forward many specialties for 1901. The Coast-er Brake will occupy a prominent place; the Cushion Frame is an innovation that is coming more into favor. The models of wheels for the new year are lighter than usual, but no strength is sacrificed. Motor Cycles will be in operation in the hall below the main floor. Automobiles also will be exhibited.

## The Todd-Donigan Iron Company's Catalogue.

**T**HE TODD-DONIGAN IRON COMPANY of Louisville, Ky., have issued their catalogue No. 3, 316 pages. The goods covered are principally supplies for railroads, contractors, machine shops, blacksmiths and manufacturers. While the catalogue contains fewer pages than the former one issued by the company, it embodies much more matter, as the result of reducing the size of many illustrations and of the grouping of cuts. With the exception of a few lines which are shipped from factory and which are marked with an asterisk in the catalogue, no goods are shown but those carried in stock. Tables of information as to weights, sizes, gauges, &c., are given for the information of customers, who, no doubt, will appreciate the efforts of the company in presenting them this well arranged and attractive volume.

### William E. Gibbins.

**W**ILLIAM E. GIBBINS, vice-president of the Woodruff Hardware Company, Knoxville, Tenn., died at his home in that city January 3, after an illness of five weeks. Mr. Gibbins was born in Liberty, Ky., October 12, 1843, his childhood and young manhood being spent in that town. Soon after the commencement of the Civil War, when only 18 years old, he enlisted in Company D, Thirteenth Kentucky Infantry, commanded by Colonel, afterward General, Ed. Hobson. The commander of his company was Captain W. W. Woodruff. Mr. Gibbins came with his command, under General A. E. Burnside, into East Tennessee and to Knoxville, in the early fall of 1863. On the afternoon of November 14 of that year, while with his company, charging a regiment of General Longstreet's force advancing on Knoxville, at Huff's Ferry near Loudon, he was severely wounded, and was brought to Knoxville, where he lay in the First Presbyterian Church, then used as a hospital, while Longstreet was laying siege to Knoxville, and for some time afterward. He was compelled to use crutches on account of his wound for nearly two years. For gallantry in the engagement at Huff's Ferry and for



WILLIAM E. GIBBINS.

general efficiency he was promoted to a serjeantcy, but was unable to do active duty again while the war lasted.

At the close of the war, at the request of Captain Woodruff, who then established himself in the Hardware business that has grown to such large proportions, Mr. Gibbins came to Knoxville and accepted a position as salesman in the Hardware store. In 1870 he became a partner in the business, and so remained until his death, being vice-president of the Woodruff Hardware Company. He and Captain Woodruff were associated together for 40 years, four years in the army and 36 years in business, and during that time, it is said, there never was an unkind word or feeling between them.

Mr. Gibbins was one of the founders of the Southern Hardware Jobbers' Association, serving as president during the first two years of the association's existence, during which time the organization grew from a membership of very few to about 40 of the prominent Hardware jobbers in the South. He was elected chairman of the Executive Committee of the association, at the Louisville Convention in 1895, faithfully serving in the same capacity ever since that time. His good judgment and wise counsel are referred to by a prominent officer of the association as of inestimable value, not only to the organization during its growth and development, but to the individual members.

He was a man of indomitable energy, unquestioned integrity and untiring industry. As a citizen he was public spirited, and for more than 30 years took a great interest in whatever pertained to the good of Knoxville. Mr. Gibbins held the office of Elder in the Second Pres-

byterian Church for more than ten years. He was also interested in Sunday school work as a teacher, and for many years was superintendent of the Bell Avenue Sunday School.

In 1867 Mr. Gibbins was married to Miss Helen Henry, daughter of Hon. John R. Henry, at one time Treasurer of the State of Tennessee. There were six children, all of whom are living. The eldest, William E., Jr., is a traveling salesman for Russell & Erwin Mfg. Company; another, Henry, is a Lieutenant in the Thirty-first United States Volunteers, now in the Philippines.

### William F. Rockwell.

**W**M. F. ROCKWELL, president and treasurer of the Miller Bros. Cutlery Company, died at his home in Meriden, Saturday, January 5, after an illness of about two weeks. Mr. Rockwell was taken sick in New York about three weeks ago, but, improving somewhat, he returned to Meriden, where malarial fever set in and with other complications resulted in his death.

William Francis Rockwell was born in Ridgefield, Conn., January 12, 1845. His early education was acquired at a private school, he afterward graduating from the Fort Edward Collegiate Institute. His business career began in the forwarding and commission house of Miller Bros., in New York, when about 18 years of age. He held an important position with that concern for several years, being stationed at Norfolk, Va., as supercargo of a vessel during the war. In 1868 he went to Washington, N. J., and engaged in mercantile business under the firm name of Cummins, Rockwell & Co. In 1874 Mr. Rockwell returned to Connecticut and became treasurer of the United States Steel Shear Company. In 1876 he participated in the reorganization of the Miller Bros. Cutlery Company. That concern had failed for a large amount and Mr. Rockwell, in connection with four other gentlemen, bought out the plant and reorganized the company. Mr. Rockwell became treasurer and general manager, and the late Lemuel J. Curtis was the first president. At the death of Mr. Curtis, I. C. Lewis became president, and in 1893, when Mr. Lewis died, Mr. Rockwell was elected president and held the office until the time of his decease. In 1877 Mr. Rockwell was one of the organizers and first president of the American Pocket Cutlery Association of the United States, organized to look after the protective interests of the Cutlery trade. He was also a member of the general committee on the revision of customs laws of the Merchants' Association of New York. While that organization is composed largely of importers and merchants, they recognized Mr. Rockwell's knowledge and experience and were glad to avail themselves of it. Mr. Rockwell was a prominent member of the Sons of the American Revolution and of Pilgrims' Harbor Council, R. A., and was prominent in Masonic circles, being a member of St. Elmo Commandery, K. T. He was also a member of the Hardware Club of New York.

Mr. Rockwell's personal traits and character are thus described by George H. Bartlett, who was long associated with him in business: "I had known Mr. Rockwell intimately for 26 years and during all my intercourse with him he was always the same cordial gentleman and a most loyal friend. He was magnetic, and this, combined with his keen sense of humor, kindness and fine conversational powers, made him the best of companions. Good fellowship was never wanting, and I doubt if he ever intentionally did or said anything to give offense or hurt the feelings of any one. His ability for managing the details of a rapidly increasing business was extraordinary, and yet with all his devotion to his business duties he found time to enjoy himself in rational ways. His home was an ideal one where love and courtesy reigned and where his friends were always welcome."

The following tribute to Mr. Rockwell's character and position in the Cutlery trade is from Wm. H. Maher of Toledo, Ohio, who knew him long and intimately.

"For 25 years Mr. Rockwell has been one of the controlling forces in the Hardware trade of this country, and has left his impress upon the tariff laws and rulings



to an extent that very few realize. He was a manufacturer, but he was something more than that. In a broad sense he was a statesman, and though he held no office his were the mind and brains and research and perseverance that furnished facts, figures and arguments to the men who made laws. He worked through them, meeting every point raised by the opposition, until to-day the American consumer who wishes American goods cannot be fooled by having foreign stuff forced on him under an American name.

"His battle for American Cutlery was something grand and Titanic. He was not alone, of course; he was ably assisted by many others, of whom Col. Thomas W. Bradley was one of the leaders, but the opposition was seemingly impregnable.

"Turn back in your mind 20 years and consider the condition of the Cutlery market. Our shelves looked like a map of geography. Labels were ornamented with the



WILLIAM F. ROCKWELL.

names of rivers, mountains and cities of America, and the contents were usually the trashiest kind of trash.

"Consumers who had never used an American Knife in their lives were sneering at the idea of there being such a thing in existence as a good American Knife, never suspecting that the blades stamped with the name of an American town were the product of a foreign maker.

"In the matter of protecting American labor there was practically no protection for the cutler. The tariff was high enough on paper, but a system of undervaluation was in vogue that gave no real protection.

"Mr. Rockwell began his battle as a lawyer prepares his case when immense issues are at stake. His fight was to be made on facts, facts, facts!

"Every point was fortified with figures that could not be questioned. The importers, the agents of foreign manufacturers and foreign labor appealed to the Hardware trade for assistance, and shed tears over the poor consumer, who would suffer if forced to pay 25 cents for a genuine American Knife, instead of being permitted to buy a German Knife for the same price with a bogus American brand on it.

"In that contest the American cutler triumphed, and if he wished to know who was his friend he need but listen to the maledictions heaped upon Mr. Rockwell's head by the importers, whose false brands and undervaluation had been summarily interfered with. And when Congress had done its work Mr. Rockwell's task was seemingly but just begun. The men in the New York Custom House have had his knowledge at their command, and his quick eye caught at every loophole

through which the spirit of the law might have been rendered abortive.

"I made his acquaintance a quarter of a century ago, and our relations from that day until now have been close and friendly. Of all my acquaintances I know of none who has shown more resourceful energy, more knowledge of everything connected with his business, or who has left one tithe of his impress upon his associates.

"In his own office and in his home he was a most genial host. In his city and State he was one of the controlling minds, and in national affairs he was a power.

"But we do not miss our friends because of their influence or power, but because they were our friends. And I desire to lay this little flower upon his grave because he was a manly man and a lovable friend. The world will not be so cheery without him."

## The Working of the Michigan Retail Hardware Dealers' Association.

ONE of the aims of the association is to protect the retail trade from the competition of jobbers and manufacturers who sometimes go direct to their customers. For this purpose they have a carefully devised system, by means of which complaints are considered and acted upon. If after a careful examination the circumstances justify it, the matter is brought to the attention of the offending party. The way in which this is done is illustrated in the following communication, for which we are indebted to Fred. H. Cozzens, the efficient secretary of the Michigan and also of the Interstate Retail Hardware Dealers' Associations. The photographic reproductions given are about half size. Describing the working of the association, Mr. Cozzens says:

The first we know of a new member is when our solicitor calls on him, or his name is sent in through the

Michigan Retail Hardware Dealers Ass'n.	
ORGANIZED 1898.	REORGANIZED 1900.
APPLICATION FOR MEMBERSHIP.	
I, <u>John Jones</u> , representing	
the firm of <u>John Jones &amp; Co.</u>	
of <u>Ann Arbor, Mich.</u> hereby make application	
for membership in the Michigan Retail Hardware Dealers' Association.	
I fully approve the objects of this Association and desire to assist in carrying them out successfully, and hereby agree to abide by its Constitution and By-Laws and all resolutions adopted.	
Enclosed please find four dollars, for membership Fee as provided in constitution.	
Application approved <u>Dec 8 1900</u>	
Annual Dues, \$4.00.	Membership \$4.00.
This amount includes our dues on your membership in the Interstate Association.	

Application Blank.

mail, either by himself or by some one who is interested in having him join. When the application is by mail we immediately send an application blank (as shown herewith), and when this is returned to us with remittance—viz., \$4—to pay State and Interstate dues, we send them a receipt (also shown). The receipts are in duplicate, with a stub. If the application is taken by our solicitor the receipt is delivered to the applicant at the time and the duplicate is turned in to this office.

Let us suppose that the application is from John



Jones & Co., Jonesville, Mich. As soon as the application is received the name is entered on our books as a member, subject to approval of our Executive Committee, which meets three times a year. At these meetings all applications received since the previous meeting are passed upon, and, as a rule, all are accepted, although we sometimes find reason for rejection. Mr. Jones is then notified that he is a member of the Michigan Retail Hardware Dealers' Association in good standing.

Our membership consists of legitimate retail Hardware dealers in towns large enough to support such stores, and in some of the smaller towns we take in some general stores which handle Hardware, where they are not objectionable to the regular trade.

John Jones & Co. are now full fledged members of the Michigan Retail Hardware Dealers' Association, and we send them a number of complaint blanks like the one filled out herewith, with a letter instructing them as to their purpose and how to use them. We will assume that Jones, Smith & Co., jobbers, are found to be selling to the consumers in Jones & Co.'s territory. They write to us to this effect, and as a rule we are obliged to write them to secure all the information they can relative to

APPLICATION FOR MEMBERSHIP AND RECEIPT FOR FEES 299

OF THE

**Michigan Hardware Association.**

**\$3.00.**

This is to Certify, that John Jones & Co. has herewith made application for membership to the Michigan Hardware Association, and, if accepted, will abide by its laws, rules and regulations; and will promptly pay all such dues, fines and assessments as may be ordered by a majority vote.

That the Association hereby acknowledges the receipt of **Three Dollars** membership fee, pending acceptance by the Association the yearly dues of which are Three Dollars payable in January.

Fred H. Cozzens President.

Countersigned by J. J. Schatz Organizer, this 25th day of December 1900.

Receipt Blank.

the matter, for dealers are quite likely to be careless in obtaining particulars, and we ask them to enter complaint against the jobbing house on our regular complaint blank.

We then write Jones, Smith & Co. about as follows:

A complaint has been entered against you by a member of our organization, advising us that on November 22 your salesman sold one 12-gauge take-down, model 1900, Winchester Repeating Shot Gun to Charles Peterson, at Jonesville, Mich. The said Gun was shipped by express and was delivered to Mr. Peterson, at Jonesville, on November 25.

It is not necessary for me to call your attention to the fact that this is not only a violation of the ordinary ethics of trade, but also of the resolutions adopted by our organization, as per inclosed copy.

We cannot understand how you expect to sell the retail Hardware trade, members of our organization, and at the same time sell goods to their customers, and we are sure that the sale must have arisen from some misapprehension of the facts in the case, and that it took place without the knowledge of any member of the firm.

Will you kindly make a thorough investigation at once and advise us of the circumstances, and let us have your assurance that a similar case will not occur again?

The decision in this instance is indicated on complaint envelope.

In most cases the matter is adjusted at once by the jobbers consenting to adhere to our request in this as well as in future cases.

All the correspondence received from our member, copies of letters from this office to the jobber or manufacturer complained against and their replies are filed in a large, strong manilla envelope, an illustration of which is given herewith, where they can be readily referred to when needed, much after the manner in which railroads keep their freight claim correspondence, thus enabling us to put our hands on the complete file of letters at a moment's notice.

Sometimes one letter settles the case, but frequently we are compelled to write two, three and occasionally even four letters. Each letter is made a little stronger than its predecessor, and sometimes we are forced to advise the people that further silence on their part will be construed as indicating an unfavorable feeling toward the work we have in hand, and that, if we do not hear from them by a certain date, we will be forced to notify all of our members to that effect, and this letter invariably has the desired effect.

In justice to the manufacturers and jobbers doing business in this State, however, we must say that we have had very little cause for complaint.

When the complaint is so serious that it involves jobbers and manufacturers outside of the State of Michigan, it is referred to the secretary of the Interstate Re-

Complaint No. 73 Refer to this number in all correspondence.  
Give Complete Details of Case using back of sheet if necessary.

**THE MICHIGAN HARDWARE ASSOCIATION.**

COMPLAINT BLANK.

Jonesville Mich., Dec 7-1900.

FRED. H. COZZENS,  
Secretary Michigan Hardware Association,  
Detroit, Mich.

Dear Sir:

We desire to enter formal complaint against Jones Smith & Co. of Ironburgh Mich. for violation of Article XIII. of the Constitution and By-Laws of our organization, the circumstances of the case being as follows: On Nov 20 their salesman was in Jonesville calling on the trade. Mr. Peterson a friend of his had been looking at guns at their store and meeting them men on the street was offered one direct from their house at \$18.00 which was \$1.00 below our price. Gun was delivered to Mr. Peterson by the United States Ex. Co. on Nov 25. These facts were obtained from a friend who overheard the original conversation.

Yours truly, John Jones & Co.

Received by Secretary Dec 8-1900

Entered in Complaint Book, Folio 32 Forwarded to Investigating Committee

KEEP A COPY OF THIS FOR YOUR OWN CONVENIENCE.

Complaint Blank.

tail Hardware Dealers' Association, and by him is taken up with the jobbers in the States surrounding the one where the complaint arises, in the same manner as the Michigan Retail Hardware Dealers' Association handles its complaints locally in the State of Michigan.

We maintain that the mere fact that we have a watchful, aggressive organization, whose members are always on the alert for violators of trade ethics, is of itself productive of much practical good in preventing the few who are inclined to make a business of this sort of thing from getting into bad habits.

We have yet to find it necessary to issue a bulletin to our members advising them that any concern has absolutely declined to respect our wishes, but in one or two instances we have been within an ace of doing it. Should such steps be taken, our members are bound by the constitution and by-laws, which they have signed and agreed to, not to purchase any more goods from the manufacturer or jobber in question until the matter is disposed of to our satisfaction. I believe that the jobbers and manufacturers who do business in this territory realize this point very well, and as a consequence will respect our requests, if just and reasonable, as we intend they always shall be.

We have several cases before us now which must be disposed of at the next meeting of our Executive Committee, but the chances are that before that time everything will be adjusted on a satisfactory basis.

We have in our Michigan Association to-day about 300 of the leading Hardware dealers of the State, who have paid their State and Interstate dues. There are about 600 dealers in Michigan who are rated between \$4000 and \$5000, and about 1200 concerns in the State, all told, who handle Hardware. I am confident that in less than two years, at least 600 of these merchants will be active members of our association.

Strange as it may seem, it is more difficult to interest the small dealer in this work than it is the large and more successful dealer, although it must be plainly apparent that it is the smaller dealer who needs the protection most.

In organizing such an association it is liable to be very discouraging, owing to the lack of interest on the

### The Michigan Retail Hardware Dealers Association.

#### Complaint Envelope.

No. 23  
 By Whom Filed. John Jones & Co.  
 Of. Jonesville Mich.  
 Against. Jones Smith & Co.  
 City. Ironburgh  
 State. Michigan  
 Date Filed. December 8, 1900  
 Date Closed. December 10, 1900

#### REMARKS:

Wrote J. S. & Co. Dec. 9, 1900  
Answer rec'd Dec. 10, 1900  
Satisfactory Explanation  
offered. Firm made  
Credit Memorandum to  
John Jones & Co. Hardware  
Dealers at Jonesville  
on this sale.

Wrote J. J. & Co. Dec. 10, 1900

Complaint Envelope.

part of the average merchant, but if persevered in will eventually prove a success; but it is only through the publication of educational articles in such papers as *The Iron Age* that this can be overcome.

The Hardware dealers of the United States certainly owe your paper a great amount of gratitude for the space you have at all times so liberally devoted to their interests.

The male employees of A. B. Ware, Hardware merchant, Opelika, Ala., 13 in number, participated on the 27th ult. in the third annual banquet given by the proprietor. One side of the menu card was attached a souvenir Spade finished in gold bronze, suggesting the digging up of new trade to make gold. The names of the employees were printed above and below the Spade. The other side of the card was devoted to an attractive menu. An enjoyable evening was spent, the head clerk acting as toast master. These occasions are looked forward to with the pleasantest anticipations by the employees, and are always thoroughly enjoyed by them.

### Beers & Mitchell.

BEERS & MITCHELL, 98 Chambers street, New York, manufacturers' agents and direct representatives to the jobbing trade, is the name of a partnership recently formed to represent in the Southern States the manufacturers named below. The senior partner, Henry H. Beers, is already widely known in the South and West, where he has traveled for more than 30 years. Guy Mitchell, formerly of Atlanta, is the junior partner, whose assistance is necessitated by the increasing number of concerns whose goods are marketed. The firm will represent the following manufacturers: American Cutlery Company, Atha Tool Company, Atha Steel Company, Atlas Shear Company, American Shovel & Stamping Company, Buffalo Scale Company, Chattanooga Implement & Mfg. Company, Couch Bros. & J. J. Eagan Company, Hay-Budden Mfg. Company, Herrman Bros. & Co., the Mallory-Wheeler Company, W. N. Merriam, Norton Tool Company, Oneida Community, St. Louis Sweat Pad Works, Schmachtenberg Bros., the Silver Mfg. Company, Harding Edge Tool Company.

### Calendars, &c.

THE PHILIP CAREY MFG. COMPANY, Lockland, Ohio, manufacturers of Carey's Magnesia Flexible Cement Roofing.

JOHN T. DONOHUE & Co., Baltimore, Md., manufacturers of Blocks, Pumps, &c.

CONCORD AXLE COMPANY, Penacook, N. H.: Diary for 1901, including atlas, &c.

BOEBINGER HARDWARE COMPANY, Cincinnati, Ohio, jobbers of Hardware, &c.

THE MILLER SUPPLY COMPANY, Huntington, W. Va., dealers in general supplies and machinery.

THE THOS. DAVIDSON MFG. COMPANY, Montreal, Canada, manufacturers of Steel Enameled Ware and Sheet Metal Ware.

CRANE BROS., Westfield, Mass., manufacturers of Linenoid Seamless Specialties and builders of Boats, Canoes, &c.

HERTZOG & HEILMAN, Reading, Pa., dealers in Hardware, &c.

RED JACKET MFG. COMPANY, Davenport, Iowa, manufacturers of Pumps, Steel Galvanized Pipe, Hay Tools, &c.

WALSH'S SONS & Co., Newark, N. J., wholesale dealers in Scrap Iron and Metals: Memorandum Calendar and diary pad.

HIBBARD, SPENCER, BARTLETT & Co., Chicago: New edition of their "Buyers' Want Book" for 1901, containing calendar for the year and blank pages for memoranda. The size of the page is 5½ x 10¼ inches.

THE WM. CABLE EXCELSIOR WIRE MFG. COMPANY, 43 Fulton street, New York, manufacturers of Fourdrinier Wires, Cylinder Molds, Dandy Rolls, Office and Bank Railing, &c.

### Trade Items.

THE employees of the A. F. Shapleigh Hardware Company, St. Louis, as a fitting tribute to the president of the company, A. F. Shapleigh, on January 1, 1901, presented him with a gold headed cane, having inscribed thereon "To Start the Twentieth Century." The presentation was made at the president's residence with an appropriate address, to which Mr. Shapleigh responded happily. Mr. Shapleigh is now in his ninety-second year and in the enjoyment of perfect mental vigor and ability. Mr. Shapleigh's experience in St. Louis began in 1843, at which time he was sent from his Philadelphia house, Rogers, Field & Co., to open a branch for them in the West.

GEORGE C. PLUMMER has been appointed manager of the Boston office, at 120 Pearl Street, of the Main Belt Company of Philadelphia, Pa.

W. J. GLUCKERT & Co., 102 Chambers street, New York, have recently been made the direct representatives in Greater New York of the Standard Company, 107



Haverhill street, Boston, Mass., who are manufacturers of Dover pattern Egg Beaters. This company manufacture six different sizes of Egg Beaters in three styles of finish, Japanned Iron, Tinned and Steel Handles, the latter being referred to as especially suitable for export owing to decreased weight. Being entirely of wrought steel they also are not liable to break if dropped.

ESTATE of Edward F. Keating, 446-454 Water street, New York, announce that Thomas F. Cushing will hereafter be associated with them in the conduct of their business. Reference is made to Mr. Cushing's long and intimate acquaintance with the requirements of the trades to which they cater.

CHARLES E. MILLER, dealer in Automobile and Cycle material, 97-101 Reade street, New York, has taken the balance of the loft where he is now located and is arranging a large room in the Reade street end of the building in which to display lines of Cycle and Automobile parts, fittings and sundries. He is also now in a position to make prompt deliveries, and is continually adding to his stock new articles of this character as they come on the market. At the Cycle and Automobile Show, to be held in Madison Square Garden, beginning January 12, he will have on exhibition a complete line of parts, fittings and sundries for Cycles, Motor Cycles and Automobiles. Mr. Miller has secured new agencies for the different classes of goods in this line, and is desirous of adding a few others of suitable character in the near future.

### Death of W. E. McGary.

THE death of W. E. McGary in the thirty-eighth year of his age occurred on Christmas morning at his home in Paducah, Ky. Mr. McGary was for many years representative in Kentucky of the Simmons Hardware Company, St. Louis, Mo. In the announcement of his death by W. D. Simmons, president of the company, a high tribute is paid to his character and worth. His straightforwardness and integrity, coupled with a genial and kindly manner, as well as his loyalty to his company and to his customers and friends, are especially referred to. This additional tribute is also paid to him: "He was an unusually strong example of that class of travelling salesman which has in the past decade so revolutionized public opinion of what was formerly almost universally termed a 'drummer.' To-day the name of a thoroughly successful traveling salesman brings with it the impression not only of a man of energy, brains and ability, but a clean, upright and admirable character. This change is due almost wholly to the influence of such men as W. E. McGary."

### The Manufacture of Pocket Cutlery.

WE have recently received an inquiry as to the oldest manufacturers of Pocket Cutlery in the United States, and find as the result of investigation that the Holley Mfg. Company, Lakeville, Conn., are probably entitled to the first place in this respect among manufacturers of this line of goods. The following are the Pocket Cutlery concerns now in active operation with the dates of the establishment of the business:

Holley Mfg. Company, Lakeville, Conn.	1844
New York Knife Company, Walden, N. Y.	1852
Aaron Burkinshaw's Sons, Pepperell, Mass.	1853
Empire Knife Company, Winsted, Conn.	1856
Northfield Knife Company, Northfield, Conn.	1858
John Russell Cutlery Company, Turners Falls, Mass.	1865
Humason & Beckley Mfg. Company, New Britain, Conn.	1866
Southington Cutlery Company, Southington, Conn.	1867
Miller Bros. Cutlery Company, Meriden, Conn.	1870
Walden Knife Company, Walden, N. Y.	1870
American Shear Company, Hotchkissville, Conn.	1870
Cattaraugus Cutlery Company, Little Valley, N. Y.	1880
Novelty Cutlery Company, Canton, Ohio	1885
Electric Cutlery Company, Newark, N. J.	1890
A. F. Bannister & Co., Newark, N. J.	1893
Robeson Cutlery Company, Rochester, N. Y.	1896
Jackson Knife & Shear Company, Fremont, Ohio	1898
Foster Bros. & Chatillon Company, Fulton, N. Y.	1899
J. Curley & Bro., New York, N. Y.	1899
Valley Forge Cutlery Company, Newark, N. J.	1899

S. H. Davis & Co., 44 Portland street, Boston, Mass., are now settled in their new store. The whole interior is finished in quartered sawed oak and is fully equipped with Heller's Steel Boxes.

### CONTENTS.

	PAGE
Direct Connected Steam Engines and Generators.—II. Illustrated	
The Ship Subsidy Bill .....	5
Plastic Pressure Tube Expander. Illustrated.....	6
The Universal Work Holder. Illustrated.....	7
The New Bayonne Plant of the Babcock & Wilcox Company.....	7
The Evans Ingot Stripper. Illustrated. ....	8
A Successful Siphon. Illustrated .....	10
British-Westinghouse Electric Company.....	11
The Berlin Construction Company.....	11
The Granite City Plant of the National Enameling & Stamping Company. Illustrated.....	12
The Interstate Commerce Commission.....	17
The Evans Multiphase Rotary Engine. Illustrated .....	19
Canadian News.....	21
The Foundrymen's Association.....	23
Notes from Great Britain .....	24
The Pittsburgh Valve, Foundry & Construction Company.....	24
Editorials:	
The Unification of the Railroads. ....	25
Gold and Trade.....	25
South African Orders for American Manufacturers.....	26
Correspondence .....	27
The Carnegie Steel Company Going Into Tubes .....	27
Personal.....	28
The Rock Island Arsenal Bids .....	29
The Standard Seamless Tube Company.....	29
Prosperous Connecticut Industries.....	29
The Springfield Boiler Works.....	29
The Harbison-Walker Company.....	29
The Firth-Sterling Steel Company.....	29
Cold Rolled and Cold Drawn Shafting .....	29
The Valley Furnace Scale .....	29
Pig Iron Production Sharply Increasing.....	30
Manufacturing:	
Iron and Steel.....	31
Machinery.....	31
The Iron and Metal Trades:	
A Comparison of Prices.....	33
Chicago.....	33
Cincinnati.....	35
Philadelphia.....	35
St. Louis.....	36
Pittsburgh.....	36
Cleveland.....	37
Birmingham.....	38
German Iron Market.....	38
New York.....	38
Metal Market.....	39
The New York Machinery Market.....	39
Iron and Industrial Stocks .....	40
Obituary.....	42
The Pridmore Molding Machine Works .....	43
The Bridge Workers' Strike.....	43
The New South Wales Steel Rail Contract.....	43
Otis, Hough & Co.....	43
The Sydney Harbor Bridge.....	43
Hardware:	
January Work.....	44
Export Trade .....	44
Condition of Trade .....	44
Special Reports.....	45
Notes on Prices.....	45
Requests for Catalogues, &c.....	46
The Export Trade .....	47
Export Notes .....	47
Cultivating English Trade.....	48
British Letter.....	49
From an Australian Correspondent.....	49
Western Washington Hardware Association .....	50
Missouri Retail Stove and Hardware Dealers' Association.....	50
Death of Frank Shapleigh. Portrait .....	50
The Old Year and the New in Hardware.....	51
Exhibition of Cycles, Motor Cycles and automobiles .....	51
The Todd-Donigan Iron Company's Catalogue.....	51
William E. Gibbins. Portrait .....	52
William F. Rockwell. Portrait.....	52
The Working of the Michigan Retail Hardware Dealers' Association. Illustrated.....	53
Bakers & Mitchell .....	55
Calendars, &c .....	55
Trade Items .....	55
Death of W. E. McGary .....	56
The Manufacture of Pocket Cutlery .....	56
January Work in the Hardware Store.....	57
The Wadsworth-Howland Company .....	59
Consolidation of Dairy Supply Interests .....	60
The Van Wagoner Company .....	60
Lockwood-Taylor Hardware Company's Catalogue .....	60
National Table Cutlery Company .....	60
Fairbanks Company's New Catalogues .....	60
Price-Lists, Circulars, &c.....	60
Among the Hardware Trade.....	61
Gurney Tile Lined Refrigerators. Illustrated .....	62
Farriers' Pincers.....	62
Curved Blade Shears and Scissors with Spring. Illustrated.....	62
Little Giant Grass Hook. Illustrated.....	62
The Pivot Swing. Illustrated .....	63
Short Blade Socket Firmer Chisel Sets. Illustrated.....	63
Can Bung. Illustrated .....	63
The Witham Wire Stretcher. Illustrated.....	64
The Sanitary Refrigerators. Illustrated.....	64
The Marquis Tea Spoon. Illustrated.....	64
Current Hardware Prices .....	65
Current Metal Prices.....	72



## January Work in the Hardware Store.

*This subject, brought up in an earlier issue, is considered below in some of its different aspects. Further advices are invited from the trade as to the things which they regard as coming in under the head of JANUARY WORK.*

### LETTERS FROM HARDWARE MERCHANTS.

A communication which we printed in *The Iron Age* December 27 has called out a number of letters from Hardware merchants, extracts from some of which are given below. As reference is made by several of our correspondents to this letter, some of them supplementing it and others criticising the suggestions it contains, we give the following list of the things which are put down in it as the January work of the store:

Finish up inventory.  
Collect overdue accounts.  
Find out economies to be effected in the business.  
Make clearing sale of unsalable goods.  
Strengthen lines which have not paid, or drop them.  
Cultivate trade by appeals to large consumers personally or by letter.  
Obtain quotations from manufacturers on Lawn Mowers, Ice Cream Freezers and Steel Goods.  
Resample Cutlery.  
Renew soiled or worn out price cards.  
Order new letterheads.  
Try A. B. J. and B. F. C. (two of our clerks) at preparing advertisements.  
Put away holiday stock.  
Display Refrigerators, Skates, &c.  
Arrange new racks for Shovels, Spades, &c.  
Advertise winter goods and household articles.  
Place orders for spring goods.

The general subject is discussed in the following letters, which are interesting as presenting the views of the writers on several subjects connected with the one under discussion:

#### Illinois.

My work for January is quite well covered in the above list of our friend. I think one of the greatest advantages in the business is displaying your goods in show windows, and during January I will make new designs, &c., for displaying my goods in that way. I now have a Christmas window which has received many favorable comments.

I am a strong believer in the above plan and find it a most valuable help to my business.

#### Connecticut.

Our principal work consists in getting our inventory, and at the same time cleaning house of old stock or slow goods, and then we do what we can in the line of placing advertising for the year, buying seasonable goods for spring and summer, and getting our forces in working order for spring business.

#### Massachusetts.

We would add the following to the work referred to by your correspondent:

Pay every account that we owe up to January 1 and effect settlements with our customers as far as possible.

Charge off poor accounts and carry doubtful ones to suspense ledger.

Map out the policy of our business for the coming year, and plan so as to increase it and to cut short our losses.

#### New York.

Your correspondent covers the ground pretty completely, leaving little for us to say. One point we would suggest: No matter how careful you are you will lose a few customers during the year, and you are at a loss to know the reason. We find that some people are offended at some trivial remark or jest; or the repairing of a Stove, Eave Trough or what not was not done just to their idea.

We suggest that to these people you go and ask point blank what is the matter, and in nine cases out of ten

you can explain the trouble and get them back to your store.

#### Connecticut.

We have carefully gone over the work laid down by your correspondent and find that

it is almost identical with our own system of treating January work.

At this time of the year we go through our stock very carefully and make a note of all lines that we are overstocked on and that are not moving. We make a careful list of all this stock and compare our selling prices with the present market conditions, and then revise our prices and bring these goods to the front and advertise them. If we find it necessary to put an attractive price on these goods for the purpose of moving them we do so.

We also cull out at this time all goods that can properly be considered as shop worn and put them on a bargain counter, attach conspicuous price tags to same and also advertise these goods. In this way we endeavor to keep our stock as clean as possible.

In a general way we follow out practically the work as indicated by your correspondent. We consider it a good plan and it will, if followed out carefully, result in much good to the dealer.

#### Indiana.

Our January work consists principally of invoicing, straightening up stock, collecting accounts, and we usually try to have a special sale on some class of goods which we are desirous of introducing during this month; also in February.

We carry our line of winter goods on the main floor until the latter part of February, when we take them away and get out our spring and summer goods, such as Refrigerators, Vapor Stoves, Lawn Mowers, &c.

We do not lay our work out a year in advance, owing to the fact that we advertise and push our goods somewhat according to the weather and season, endeavoring as far as possible to have our business conform with the demands and the seasons.

#### New Jersey.

Owing to the number of lines we are engaged in January is generally our busiest month, with the possible exception of October. Our fiscal year does not end till March 1, so we have no inventory to bother us, and the only special work we know of is making up our Seed order and getting prices on spring goods, such as Wire, Lawn Mowers, Tools, &c. Collections, changing of windows, showcases, we follow religiously all the time.

#### Maine.

We clean up stock and bring to light goods that have not been moving and put them on a bargain counter at a price that will sell them. We revise our cost books and make general preparations for the business of the coming season.

#### Connecticut.

It would seem to the writer that laying out work in advance would be governed entirely by past year's results, and if one has these results before him January 1 he is then prepared to shape future policy. If the business has been satisfactory and has shown as large a profit as the amount of business done should show, then the course would seem to be on same lines; but if opposite results prove true then it is wise to sit down with your partners or salesmen and find out, if possible, where the trouble is, and then lay out for the new year a different line of proceedings.

Can hardly see how one can shape whole year's business in January, except, possibly, a general policy to pursue. A retail dealer in Hardware is learning something new every day, and in these times of changes in prices, styles, &c., and the general desire of all of our customers for something new, one has to keep thinking 12 months in every year in order to keep up with competition. The items mentioned by your correspondent as set down for January all seem wise, and seem to us about the general line every dealer follows in January.

especially as to collecting accounts, cleaning up store, &c.

In former years January was supposed to be a dull month. We find in late years that our business holds up to good proportions during this month and time is not so heavy on our hands as during February, and we usually do our cleaning up more in February than January.

#### Illinois.

We believe in having our work always laid out as far ahead as possible. We commence invoicing always on December 26. This gets things cleaned up and we know where we stand, and are prepared to make purchases and contracts and make improvements and get ready for the new year's work early.

We always clean up, paint, recover fronts of boxes, renew samples and put fresh price tickets on where necessary, and go through our office in the same way, cleaning and making improvements we think will be to our advantage. In fact, we use the month of January for a house cleaning month.

We also have a "rummage" sale, taking any poor or unsalable stock we find during our invoicing, getting them all in front, and advertising and putting a price on them that will take the goods out of the store, no matter what they cost.

#### Pennsylvania.

January is a month that is never very rushing in the Hardware trade. However, February is the duller month in this section, and February is the month we take stock. We generally utilize January in getting the store in good shape for stock taking. Yesterday we had two of the boys fix racks for Strap and T Hinges. We also made racks for Sash Weights.

The first of January can be made a good time in clerical department to insist on settlements.

I do not wish to make any criticism on your correspondent's letter, but the one item of displaying Refrigerators and Skates together strikes me as peculiar to some section with which I am not acquainted.

We are about finishing our plumbing and roofing jobs and we generally use January as a good cleaning up time, reducing force as much as practicable.

#### Connecticut.

Your correspondent has described the usual lines of general work, and his suggestion to put the list on paper is a very good one. We do not see that we can add much to this list, but we would suggest that to collect overdue accounts, economize, improve stock, and cultivate trade, are the most important things to be done every month, from January to December, inclusive.

#### From an Indiana House.

In an interesting and suggestive letter an Indiana correspondent explains that having cultivated the holiday trade to a considerable extent, the fall rush extends very close to January 1. Concerning January work he writes:

From January 1 until about the 20th I have the spare time employed in a general cleaning up of tag ends preparatory to taking the annual inventory. A portion of the time is devoted to getting the plumbing and tin shop departments whipped into good clean shape. I have all the jobs on hand cleaned up, as far as possible, and get all partly manufactured material, which will accumulate in the best regulated shop, into finished shape, so as not to have to guess at its value. All old material is also collected, such as brass, zinc, copper, lead, iron, &c., and have it well assorted. This is the main thing in securing the highest market price for old material. It is then marketed to the best advantage. If the old material is handled systematically, it can be made quite a source of revenue. Invoicing, which generally takes up the time from January 20 to February 1, is never rushed, but is taken carefully and systematically. It is a time of the year when current sales interfere very little, and there is no especial reason on that account for rushing the inventory, if a strict account is kept of the sales of invoiced goods, which is not a hard thing to do.

Taking Inventory. There is no especial reason on that account for rushing the inventory, if a strict account is kept of the sales of invoiced goods, which is not a hard thing to do.

The way in which the co-operation of the clerks is secured is especially suggested. Taking, as they do, an active interest in the welfare of the business, they are expected to make memoranda which will aid in introducing improvements of one kind or another. On this subject our correspondent writes:

The clerks are instructed to keep a very careful memoranda while invoicing of every matter which in their judgment is worthy of after consideration. They are allowed a wide latitude in this respect, so that no suggestion can possibly escape which would prove of value. As a consequence many of the suggestions are thrown out, but a mass of the memoranda is found valuable. This results in careful work, in which the help and myself participate, during the month of February. This plan has been found very helpful in making the business run more smoothly during the remainder of the year, and is of great financial benefit.

Among the items suggested by the memoranda are such as the following:

*Articles recognized as having been in stock at the time of inventory the year before.*

If these are not staple goods they are put on a bargain counter in a prominent place in the store and are offered at prices which should move them. If they do not sell, they are marked lower yet, and are continually marked down until they are sold. When articles get to this point they have to be pushed out quickly regardless of price. I have very radical views on this point.

*Goods wanted.*

This is a matter of which careful account is taken.

*Change of brands.*

Often a clerk when invoicing an article remembers complaints which have attended its sale, and suggests a change of brand, which upon investigation is often made.

*Improvement in arrangement of stock.*

A certain corner in the store needs a radical cleaning out, new paint; the shelves need changing so as to more readily accommodate certain sized packages; unhandy Nail bins, which cost more in wages than new ones would cost, need attention.

These are but a few of the complaints and recommendations which are piled up at the end of an invoice.

#### Co-operation of Clerks.

A North Carolina correspondent, referring to January work in the store, writes that before taking inventory each man is supplied with a book, divided into pages covering the following points:

*Goods wanted.*

*Goods for which sample boards should be made, or a better display devised.*

*Goods which are bad stock; or odds and ends.*

*Goods to be marked, additional lists made, or prices corrected.*

Each man is expected to make proper notations in his book as the inventory progresses. After it is completed each subject is reviewed in the various books, and the necessary steps are taken to put the stock in good shape. A meeting of all the salesmen in the store is called once a week, at which suggestions are made relating to the work of the month. The inventory and resulting work consume the month of January.

#### WHAT WE DO IN JANUARY.

FROM A WESTERN MERCHANT.

Get ready for it first during the week intervening between Christmas' ending and the first day of the new year; get ready for inventory by measuring rolls of Belting, Oil Cloth, Screen Wire, Poultry Netting, Rubber Hose, leaving a memorandum slip with each line; count the loose Bolts, Lag Screws, Twist Drills, Hand Taps, Cap and Set Screws, Finished and Semi-finished Nuts;



count, weigh and mark and clean up everything that will permit of it and is not of a class constantly depleted by sales each day.

#### Inventory.

In this way it is wonderful how greatly the time of inventory is shortened. By the way, the inventory is never finished until every set of men in each department have submitted with their sheets a memorandum of all shortages for the want book (it is the ideal time of the year to find correctly your wants). White newspaper stock, cut to size, is splendid for purposes of stock taking, using two men together, one to call off and one to set down; then all to be handed in for copying in books No. 1, 2 or 3, as the case may be—leaving it in good shape for reference as an insurance record, and for the year's buying of new stocks as a guide. While copying, figuring and carrying out is being done in the office, all loose stocks and short goods, such as Bolts, Screws, Nuts, Washers, Rivets, &c., can be filled up and rearranged for the year's beginning.

As the next best thing after finishing stock taking would suggest getting at

#### Neglected and Overdue Accounts.

They are the bane of every merchant's existence, and at this time, as at no other of the year, very many of them can be collected. Many customers will settle then from whom it is hard to collect later in the year. The temptation is great to depend for one's financing on those accounts that are easy to get and always certain to come in or to be had for the asking, while the slow ones are let run or neglected. It is surprising what a little hard work will do at this time of year with a capable man back of the collections. Very many customers will not pay until asked to do so, and on the other hand only await the asking.

Many of us have a large country clientele—hard to get at and particularly hard when the account exists—yet a cleverly worded letter stating your case and asking for funds in a way that will not antagonize will bring the majority of them on first trial. Threatening letters are no good—they are utterly without value. The old saying that you can coax where you cannot drive is essentially applicable in making collections.

After starting the right man or men at this vital part of the month's work, it is well to put the best man in the house for the purpose at preparing a sale of

#### Dead Stock or Unsalable Goods.

Many of us insist that we do not have it—or but little of it. All of us have more or less, and nothing is lost just now by going over and bringing it out, giving it a table or counter of its own, marking any price on it that will sell it, and instructing every man in the house to make a special effort to see it disposed of. It occurs in different finishes of Builders' Hardware, Locks, Knobs, Butts, &c., in old and old style Sash Locks, Sash Lifts, Escutcheons, Cabinet Trim, Household Goods, such as old time Coffee Mills, Clothes Wringers, and various items scattered through the store and easily found if hunted for.

Large sale cards in plain figures, at half their original value, with a little general effort, will sell every dollar's worth and you are rid of it for all time.

#### Lines That Have Not Paid

show up with every January invoice, and it becomes a good time to find out why—to either strengthen or change them, or drop them altogether. Perhaps the latter is the safest policy where good, strong efforts have been put forth on the goods without paying results. The same money put into another and better line may bring good profits.

It is a good time, too, to make a stronger effort, so that every month and each week of the coming year may be filled with goods that sell and that make the entire year a busy one—without the two old time dull seasons supposed to belong to the Hardware merchant. It is possible to add season goods, novelties and strong lines that will do this. More and more of it is being done by the merchants each year and the change in the business becomes a most agreeable one to all.

#### Economies for the Year

may be better placed in January than any other month: not the economies that come from cutting salaries of worthy employees—that is a false one—but the cutting off and shutting down on the little every day leaks and expenses. The light and heat bills are nearly always excessive and can generally be improved on. The last few years have shown wonderful changes in methods of heating and lighting. Perhaps your drayage and delivery account (always a large one) can be lessened for the year—even with a growing business.

You may for the time being—for good reasons—have given up discounting your invoices. Make some arrangement to keep it up. No one thing creates as much revenue, no one thing is so abused and so greatly misunderstood. It is not only the fact that in an average store it will pay a good clerk's or bookkeeper's salary for the year, but it is a money investment not made or allowed in any bank. As stated in *The Iron Age* a number of times, 2 per cent. at 60 days equals an investment of nearly 16 per cent. and 2 per cent. at 30 days an investment of nearly 36 per cent. Every one does not get the time to carefully go over and check invoices—it means dollars a great many times. There are other and many economies to be found.

#### The Month of Spring Contracts

is at hand in January: Your Steel Goods are to come in. It's a good time to make a new rack for them. Your bulk seed stock will need attention now, and no other one line pays so well if bought right and put in proper shape for sale. The Paint stock is to be gone over and gotten ready, and new colors selected for the early spring months. Quotations are to be sought on and contracts made for Lawn Mowers, also Ice Cream Freezers and Refrigerators. A new and better line of Hammocks are to be carried. Then there are Lawn Swings and Lawn Seats, Screen Doors and Screen Windows, Poultry Netting and Screen Wire, Water Coolers and Filters—all to obtain quotations on and contract for. A very vital thing is to see that contracts or season goods get in early—very early—they nearly all have a spring dating, and in many cases you have largely sold and are reordering by the time your competitors' first shipment is in.

#### Cultivating the Trade,

old and new, should begin in January. Forms for attractive and well worded personal letters should be gotten ready, the advertising of previous years improved upon, the reaching of trade that has never been in your house sought for. The manufacturers from whom you buy goods will aid you largely in your "spring cultivation" of trade with fresh cuts, new printed matter, catalogues, folders, vest pocket memoranda, metallic fence signs, food chopper and chafing receipts and books, tool catalogues, &c., which can be had for the asking.

January becomes the pivotal month of the year, and should have much attention. On it largely depends the results of the 11 months that follow—and the year's business. Instead of a month of dullness and rest, it should be a primal one—one full of good schemes for the year. Individual personal work will bring the year of 1901 up to what it should be.

#### The Wadsworth-Howland Company.

THE WADSWORTH-HOWLAND COMPANY, manufacturers of Paints, Indiana avenue and Thirteenth street, Chicago, have issued a neat 70-page catalogue of their products. These comprise Bay State Tinted Leads in paste form, Jewel Mixed Paints, Conqueror Mixed Paints, Domestic Mixed Paints, Floor Paints, Augite Mineral Paints, Varnoleo, Radiator Paints, Wagon Paints, Enamels, Graphite Mixed Paint, Carburet Black, Oil Stains, Varnish Stains, Shingle Stains, Oil Colors, Graining Colors, Wood Fillers, Iron Fillers, Varnishes, &c., as well as Painters' Supplies generally. Their Paints cover all desirable shades, in paste form comprising 50, and in mixed Paints 45. The company have for some time been paying special attention to the Hardware trade, and their Paints are now being carried in stock by a number of the leading wholesale merchants.



### Consolidation of Dairy Supply Interests.

THE Frank Sturges business of Chicago and that of Cornish & Co., St. Paul, have been absorbed by the Sturges, Cornish & Burn Company, incorporated under the laws of Illinois with a paid up capital stock of \$200,000. The stockholders are Frank Sturges, Lee Sturges, J. H. Cornish and W. H. Burn. The new company take over the Frank Sturges plant, located at Harrison, Green and Peoria streets, Chicago, where the manufacture of Milk Cans, Milk Can Stock, Dairy and Sheet Metal Specialties will be continued, together with the dairy supply house of Cornish & Co. of St. Paul, who have built up a reputation on their specialties, among them being the Boyd Cream Ripener, Water Tube Boilers and Milk Heaters, which they control. They also build complete butter and cheese factories. Mr. Sturges has been identified with manufacturing in Chicago for the past 35 years, and after having been in the business for so many years, feels he is entitled to a rest, and while he has consented to take the presidency of the new company, he will shift much of the responsibilities to his associates, who are younger and better able to carry the burden of a large business. His son, Lee Sturges, who has been with him in the business and to whom many improvements along the line of deep drawing are credited, will also be associated with the new company. Mr. Cornish comes to the new organization with a thorough knowledge of the dairy supply business, gained during long experience, having been for many years secretary and manager of the Cornish, Curtis & Greene Company, and later president of Cornish & Co. Mr. Burn, who has been connected with Mr. Sturges for a number of years, is well and favorably known to the Hardware trade, having called on them personally for many years. The union of interests thus accomplished is expected to lead to a large increase in business. It is the intention of the new organization to continue in their present location in Chicago until their new plant, for which plans have been drawn, and which will be erected on tracks at Western avenue, between Fifteenth and Sixteenth streets, is completed.

### The Van Wagoner Company.

THE VAN WAGONER COMPANY have just been incorporated under the laws of Delaware with a capitalization of \$750,000. C. S. Van Wagoner of the Van Wagoner & Williams Hardware Company, who was one of the original founders of the business in 1871 and who has been connected with it ever since, takes this course to utilize the friendliness and good will toward him personally, and the business with which he has been identified in the past, to found a new company to continue the manufacture of the same lines as heretofore with several additional articles. The Hardware jobbers of the country and the rival manufacturers of Mr. Van Wagoner have for a long time evidenced hearty sympathy with him in his efforts to overcome the obstacles in his way in handling and having control of the business which he had established. When the Van Wagoner Company are ready to do business they will undoubtedly meet with a very favorable reception from the trade.

### Lockwood-Taylor Hardware Company's Catalogue.

THE LOCKWOOD-TAYLOR HARDWARE COMPANY, Cleveland, Ohio, have just issued a fine illustrated and descriptive catalogue of Hardware containing 784 pages, each 11 x 8 3/4 inches. In it are included only such goods as it is their intention to carry in stock and be in condition to furnish promptly, although their sales will not be confined to goods shown in the catalogue. The attention of the trade is called to the fact that they do an exclusively wholesale business, selling no goods at retail. The goods listed are referred to as of excellent quality, some of them being handled exclusively under their own private brands. The catalogue is a well arranged and convenient one, reflecting credit on the company.

### National Table Cutlery Company.

THE NATIONAL TABLE CUTLERY COMPANY is the name of a new corporation organized December 3, 1900, under the laws of West Virginia, with a capital stock of \$50,000. The principal office of the company is at 36 Wall street, New York. The business of the corporation is manufacturing, buying and selling Table Cutlery of all kinds, and goods of every description naturally sold in connection with Table Cutlery. The officers are: President, Homer A. Curtiss; secretary and treasurer, J. S. L'Amoreaux; Directors: Henry R. Hickley, Isaac Hirsch, Homer A. Curtiss, David H. Goodell, Edward E. Wood, Jr., Morton L. Hirsch, Frank H. Oakman, Chas. F. Smith, Alfred F. Bannister, Warren P. Dustin and J. S. L'Amoreaux. This organization includes nearly all manufacturers of Table Cutlery, all of whom own stock in it, and have a single representative in the Board of Directors. While each concern are free to conduct their business in their own way the prices made by the Board of Directors are binding, and penalties are provided for deviations from prices so established. A new scale of prices went into effect January 1, there being, however, some special goods peculiar to the various companies which this agreement does not affect.

### Fairbanks Company's New Catalogues.

FAIRBANKS COMPANY, 311 Broadway, New York, have just issued illustrated catalogue and price-list No. 316 of Fairbanks' Standard Scales, Valves and Cocks, Gas, Steam, Mill, Factory and Railway Supplies of almost every description, together with a large variety of Tools and Machinery for diverse purposes. There are 703 pages, each 10 x 8 inches. While this book contains a number of their leading Scales, a separate Scale catalogue is issued giving their entire line. This company manufacture special Scales for any desired purpose or location. On one page of the book are given illustrations of their branch houses located in Albany, Baltimore, Boston, Buffalo, New York, Philadelphia, Pittsburgh, New Orleans and Montreal. An exact duplicate of this book, but greatly reduced in size, the pages of which are 6 1/2 x 5 inches, is also ready for distribution.

### Price-Lists, Circulars, &c.

SEYMOUR MFG. COMPANY, with offices at St. Louis, Mo., and factory at Seymour, Ind.: A 32-page illustrated price-list of their line of Grain Cradles and Scythe Snaths. It also gives lists on their Hickory and White Oak Spokes for wagons, carriages, buggies and carts.

ATLAS MFG. COMPANY, New Haven, Conn.: Circular relating to the Atlas Coat and Hat Hook and the Bradley Steel Wire Shelf Bracket. Particular reference is made to the strength of the latter.

NEW PROCESS TWIST DRILL COMPANY, Taunton, Mass.: Catalogue of Drills, Reamers, &c., which will be sent to any in the trade on application. A folder gives *fac-similes* of testimonials concerning their Four-Grooved Chucking Reamers.

THE CLEVELAND HARDWARE COMPANY, Cleveland, Ohio: Catalogue of 159 pages devoted to their line of Stalled Steel Vehicle Hardware.

ROGERS SCREW COMPANY, Providence, R. I.: Price-list of Improved Steel and Brass Wood Screws.

THE LOWE BROTHERS COMPANY, Dayton, Ohio: Attractively illustrated catalogues of High Standard Liquid Paints; also pamphlet entitled "How to Paint."

JOHNSTON HARVESTER COMPANY, Batavia, N. Y.: 1901 catalogue relating to Binders, Headers, Reapers, Mowers, Rakes, Hay Tedders, Harrows, &c.

WILLIAM SHAKESPEARE, JR., Kalamazoo, Mich.: Circular devoted to Shakespeare's Revolution Fishing Bait and the Shakespeare-Worden Bucktail Spinner. Mr. Shakespeare also manufactures Reels.

THE AMERICAN STEEL & WIRE COMPANY, Chicago: Catalogue of electrical wires and cables for telegraph, telephone, light and power circuits. The catalogue covers the full line of such products, giving lists on those goods

which are made in a variety of sizes or finishes. It contains also a condensed presentation of the leading features and specifications essential in ordering electrical conductors and other equipment for power circuits, electric lighting, telephone systems and street railroads. Tables are presented showing comparative sizes of various Wire gauges, tensile strength for Copper Wire, dimensions and weight of pure bare Copper Wire, resistance of pure Copper Wire, weight per 1000 feet of Copper Wire and weight per mile of Copper Wire.

**THE CHAIN STAY FENCE COMPANY**, Sterling, Ill.: Catalogue of the Chain Stay Smooth Wire Fence. Their Fence is constructed of large galvanized Steel Wire, the vertical chain stays being jointed throughout. The catalogue shows illustrations of various sizes and styles of their Fence, their Steel Frame Farm and Yard Gates, and their United States Ratchet for holding the ends of Fence Wires.

**LANSING WHEELBARROW COMPANY**, Lansing, Mich.: The company have just issued a well printed catalogue of 128 pages devoted to their large and complete line of Trucks and Barrows, the Hoag and Lansing Fence Machines, Rollers, Lansing and Michigan Runners, Carts, Steel Hods, Charging Barrows, Stone, Lime, Coal, &c. Cars, Coal Baskets, Coal Shutes, &c.

**THE KEYSER MFG. COMPANY**, Chattanooga, Tenn.: 1901 catalogue of their line of Odorless Refrigerators.

**DIAMOND TACK & NAIL WORKS**, Raynham, Mass.: Illustrated catalogue of 34 pages relating to Tacks and Nails. These goods are packed any weight in strong paper boxes or in 5 to 100 pound wood boxes and kegs.

**DILLINGHAM MFG. COMPANY**, Sheboygan, Wis.: Illustrated catalogue and price-list of the New Iceberg Hardwood Refrigerators, Sideboards, Ice Chests and Water Coolers. This company are also manufacturers of Woodenware, House Furnishing Goods and Furniture Specialties.

**FLETCHER HARDWARE COMPANY**, Detroit, Mich.: A number of pages devoted to a variety of goods to be inserted in their large catalogue.

**MORLEY BROS.**, Saginaw, Mich.: Catalogue E, relating to their well-known Blue Line Lumbering Tools, has just been issued. Reference is made in the introductory to their factory as complete in every detail, and to the materials used as the best obtainable.

**THE WILKE MFG. COMPANY**, Anderson, Ind.: 1901 catalogue of Porcelain Refrigerators. The company state that they have enlarged their facilities for the present season and have added to the all tile line an assortment of Oak Refrigerators, porcelain lined. These are identically the same as the full porcelain, except as to exterior, which is of oak, beautifully finished. They have the same frame, insulation, internal arrangement and circulation system, and are tile lined throughout. Their line now consists of 14 models, seven tile exterior and lining, and seven oak exterior and tile lining.

**MERCHANT & Co.**, Philadelphia, Pa.: Pamphlet calling attention to their manufactures, including Tin and Terne Plates, Babbitt Metals, Solders, Newspaper Metals, Metal Shingles, Spanish Tiles, &c., and also the goods of which they are importers and dealers.

**INTERNATIONAL SPRINKLER COMPANY**, 517 Arch street, Philadelphia: Pamphlet describing their wet or dry system of Automatic Fire Extinguishing Apparatus for factories, mills, warehouses, &c.

**ATLAS PIPE WRENCH COMPANY**, 121 Liberty street, New York: Folder effectively illustrating the special feature of the Atlas Pipe Wrench.

**EMPIRE FORGE COMPANY**, Lansingburg, N. Y.: Catalogue of Empire, Western, Universal and Agricultural Portable Forges.

### Among the Hardware Trade.

P. J. McDonald has succeeded O. Shern in the Hardware, Stove and Sporting Goods business in Cameron, Wis. Mr. McDonald has added about \$500 worth of goods since taking hold of the store.

Stell Bros., Implement merchants, of Mallard, Iowa, and Jos. J. Stell, for the past ten years in the Imple-

ment business in Emmetsburg, Iowa, have opened up in the Hardware and Agricultural Implement business at the latter point under the style of Stell Bros. Hardware & Implement Company. They occupy a new double frame building, 48 x 133 feet.

Heath-Lee Hardware Company, Monroe, N. C., have incorporated with a capital stock of \$60,000, paid in, and will continue the wholesale and retail business in Hardware, Stoves and Tinware, Agricultural Implements, Buggies, Wagons, &c. The company state that business has been good with them and that they have made many improvements in the establishment and are better prepared than ever before to take care of their increasing trade.

D. H. Miller, in the Hardware business at Medford, Ore., is remodeling his store.

Moorhead Bros., Holgate, Ohio, have dissolved partnership, and the business is now being conducted under the style of Moorhead, Rettig & Co.

The Hardware store of Fiske & Co., Natick, Mass., was slightly damaged by fire a short time since. The fire was occasioned by workmen dropping a lighted match into a barrel containing turpentine. The firm advise us that automatic sprinklers, with which the store is equipped, prevented what might have been a very serious conflagration.

Manier & Pequignot have succeeded Manier Bros. in the Hardware, Stove and Implement business in Versailles, Ohio.

Samuel Hill, Prescott, Ariz., whose store was destroyed by fire some time ago, has rebuilt. His new store is fitted with Heller's Steel Boxes.

James H. Glenn has purchased the Hardware business of Irving & Ricker, Caribou, Me.

J. R. Downing is successor to Downing & Campbell in the Hardware and Stove business in Westgate, Iowa.

Jacob Stahl & Son have purchased the business of A. D. Hensel, Lansing, Mich., and will probably remove the stock to their own store.

Steinhilber Bros., dealers in Farm Implements and Hardware, Pocahontas, Iowa, have sold their stock of Hardware, and will hereafter devote their attention to Farm Machinery, Wind Mills, Wagons, Buggies, &c.

Gallagher Bros. have succeeded Gallagher & Bixle, Salamanca, N. Y., dealers in Iron and Steel, Hardware, Stoves, Wagons and Buggies, Farm Machinery, Brick, Lime, &c., also Plumbing.

Gus Schlager has disposed of his Hardware business in Lakeview, Ore.

The Storck-Hopkins Company have succeeded Storck & Hopkins, Portsmouth, Ohio.

Judith Hardware Company, Lewistown, Mont., have just taken possession of their new store.

John Smith Hardware Company, recently organized, of which Mr. Smith is president; J. P. Strickler, vice-president, and H. W. De Muth, secretary and treasurer, have succeeded Macomber & McCann in the Hardware business at that point.

Geo. M. Scott-Strevell Hardware Company, Salt Lake City, Utah, have opened a branch store at Ogden, Utah. The new store is equipped with Steel Boxes made by W. C. Heller & Co.

The Drumbeller Company have succeeded William O'Donnell Hardware Company, Walla Walla, Wash.

Herman O. Roeser has recently opened up in business at Saginaw, Mich., handling a line of General Hardware, Stoves, Paints, Oils, Glass, &c.

Redford & Crossman have purchased the Hardware business of J. H. Conner, Waukesha, Wis. They have added a tin shop.



L. W. Snider & Son are successors to J. R. Schmitz, Exeter, Neb.

The Carrollton Hardware & Implement Company of Carrollton, Miss., have been incorporated with a capital stock of \$6000. The company will conduct a wholesale and retail business in Hardware, Stoves, Farm Implements, &c.

Thos. B. Russell has purchased the Hardware stock of L. N. Brainard at Canadea, N. Y. Mr. Russell has removed to new quarters and will do business strictly for cash.

Martin Odell has sold out his Hardware business in Jasper, Mich., to E. E. Carnecross.

H. M. Terrell has opened up a new stock of Hardware, Agricultural Implements, Vehicles, &c., at Gardiner, Kan.

Potter & Beard are successors to E. M. Potter in the Hardware, Stove and Agricultural Implement business at Bassett, Iowa.

The Hardware store of W. F. Stieglitz, Columbia, S. C., was robbed a short time since of about \$180 worth of goods. Mr. Stieglitz is contemplating making a number of improvements in his store with a view to carrying a larger and more varied stock.

O. L. Smith has succeeded Thomas Van Tuyl in the Hardware business in Rock Island, Ill., and removed the goods thus purchased to a new store.

#### Gurney Tile Lined Refrigerator.

The Gurney Refrigerator Company, Fond du Lac, Wis., are offering tile lined refrigerators, one style being



*Gurney Tile Lined Refrigerator*

shown in the accompanying cut. They are made in the Gurney style of construction, with removable ice compartment and cleansable features. The company issue four catalogues representing the Gurney, Cold Wave, La Belle and Tile Lined refrigerators, which they will mail upon application.

#### Farriers' Pincers.

H. D. Smith & Co., Plantsville, Conn., and 253 Broadway, New York, have just put on the market farriers'

pincer No. 605, drop forged entirely from crucible steel. This pincer is made in one size, 14 inches long over all, with jaws  $1\frac{1}{2}$  inches wide and finely polished. It is highly tempered and finished and is offered as a strictly high grade tool, having their circle S brand. They are put up one pair in a slide cover wooden box, packed three dozen in a case.

#### Curved Blade Shears and Scissors with Spring.

Krusius Bros., 296 Broadway, New York, manufacturers of fine cutlery, have just put on the market a



*Curved Blade Pocket Scissors with Spring.*

new style of scissors, one of which, for pocket use, is here shown. The peculiarity of this scissors is the blade and improved curved flat inside spring at the pivot, which, it is said, gives the scissor a perfect cutting edge from heel to point. The curvature of the blades is designed to obviate any tendency of the blades to cut into each other and thus roughen the edges. The pocket scissors shown in the accompanying illustration is made in 4,  $4\frac{1}{2}$  and 5 inch sizes. They also manufacture ladies' scissors in 4 to 7 inch sizes, inclusive, rising by half inches, the blades of which are pointed and have a more pronounced curve. Still another style of this character is in straight trimmers, made in  $6\frac{1}{2}$ , 7,  $7\frac{1}{2}$  and 8 inch sizes. All the styles named are polished and nicked. These goods are made entirely of steel and only in the best quality, branded K. B. Extra.

#### Little Giant Grass Hook.

H. S. Earle, Detroit, Mich., is offering the grass hook shown herewith. It is referred to as a miniature scythe,



*Little Giant Grass Hook.*

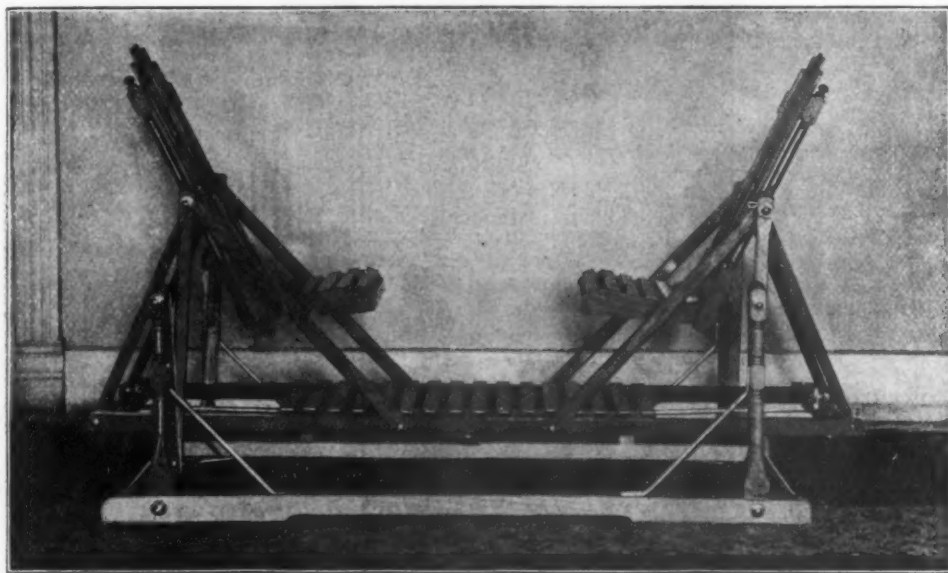
which hangs so that it cuts easily. Among the uses to which the hook is adapted are cutting lawns or corn, and clipping hedges. It is pointed out that with the hook cutting can be done close to trees.



### The Pivot Swing.

The Wilke Mfg. Company, Anderson, Ind., are manufacturing the pivot swing herewith illustrated. The frame and swinging rails are of maple, the platform and the seats of oak. The platform is hung on compound

work. This demand is especially noticeable among foreign buyers. The chisels are also particularly suitable for amateurs who have occasional use for such tools. They are put up in two forms, the No. 101 set having hickory handles and No. 401 set lignum-vitae handles, the chisel portion being the same in both instances.



*The Pivot Swing*

pivots carrying the two seats. A slight pressure of the foot on the platform actuates the swing, giving a horizontal movement of 2 feet each way from the center, or a total radius of 4 feet to and fro. There is no vertical movement whatever, it is explained, and no cause for dizziness. The seats are adjustable, and give a variety of positions. One may operate it as well as two. The following points of excellence are mentioned by the manufacturers: The swing is automatic in action, requires no push to start, and can be stopped instantly; it occupies about the same space as an ordinary couch; there is nothing to wear out or to get out of order, and it is suitable for use on lawn or porch or in a sick room or nursery.

### Short Blade Socket Firmer Chisel Sets.

J. E. Jennings & Co., 103 Reade street, New York, are putting up an especial assortment of short blade



*Short Blade Socket Firmer Chisel Set*

socket firmer chisels, as here illustrated. The blades are  $4\frac{1}{2}$  inches long, there being a demand for chisels of this character so that a mechanic can get nearer his

work. There are six chisels in a set, the diameters of which are  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{4}$  and  $1\frac{1}{2}$  inches. The material is referred to as of the finest quality.

### Can Bung.

The accompanying cut represents a can bung put on the market by J. M. Litchfield, 105 Beekman street, New York. The manufacturer had a sample of a similar bung in brass of English make submitted to him, and he has succeeded in reproducing it in cast iron. The bungs



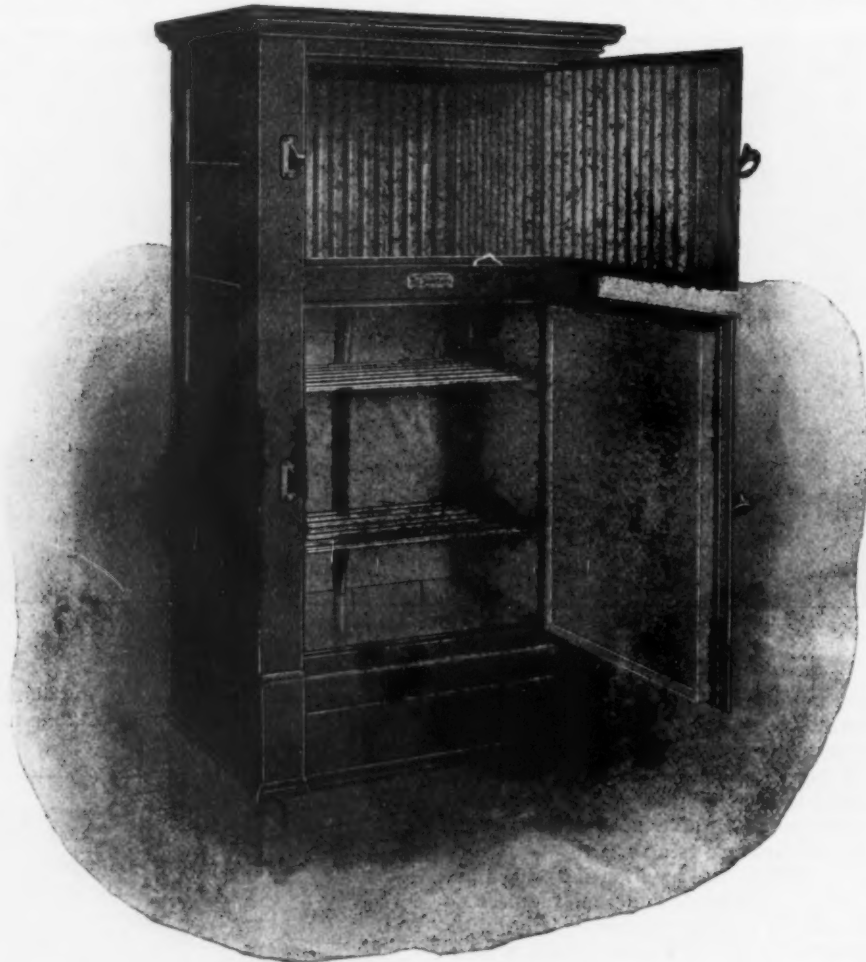
*Can Bung.*

are referred to as being cast smooth, as well tooled and nicked and as taking solder perfectly. At present they are made only in  $1\frac{1}{4}$ -inch size. They are manufactured, it is remarked, with the approval of the foreign parties who submitted the brass bung.

J. M. Kerr & Co. and E. W. Vanden & Co., Hardware dealers, Gallipolis, Ohio, have consolidated their interests under the style of the J. M. Kerr Company, who will continue the business under the management of Fred. H. Kerr and E. W. Vanden. The two former firms were among the oldest in the State, the business conducted by J. M. Kerr & Co. having been established in 1850 by Callohan & Graham. That of E. W. Vanden & Co. was established by James Vanden, now in his eighty-fifth year, in 1840. Mr. Vanden retired in 1888 and was succeeded by his two sons. The uniting of the two firms places the new company among the larger Hardware houses of Southern Ohio.

**The Witham Wire Stretcher.**

The Stowell Mfg. & Foundry Company, South Milwaukee, Wis., whose Chicago office is at 93 Lake street, are making the Witham wire stretcher, herewith illustrated. It is made of one piece, and is designed to stretch both

*The Sanitary Refrigerator.*

smooth and barb wire. It is a combined wire stretcher, staple puller and fence repairer, and has no chain or bolts in its construction. No extra post is needed, all that is necessary being the attachment of staple to the post from which one stretches. The wire is fastened in either of the two claws, and the stretcher is worked

*The Witham Wire Stretcher.*

around or against the post. The leverage is so great, it is explained, that one man can stretch the wire as tightly as he desires. When smooth wire is used the wire is locked on the middle attachment of the stretcher to prevent slipping. The stretched wire can be held in place by fastening a cord in the hole of the handle of the

a corrugated galvanized ice chamber, with a provision chamber of white enamel on wood. The refrigerators are also made with an interior finish of porcelain enamel, applied to both surfaces of high grade sheet steel, of a size proportionate to the size of the refrigerator for which the sheets are designed. This arrangement, it is pointed out, is to insure against possible breakage, and to guard against unsanitary joints. There is no charcoal or other solid packing used in the refrigerator, but an air space where, it is explained, the air may be changed continuously and free circulation may be had through the provision chamber. The refrigerators are referred to as being well built and attractive in appearance.

**The Marquise Tea Spoon.**

The International Silver Company, Meriden, Conn., are introducing the Marquise design in flat ware, the

*The Marquise Tea Spoon.*

stretcher to the wire. The middle attachment can also be used for repairing purposes, by inserting a wire in it and turning the stretcher around until the slack wire is drawn up.

new pattern being shown in the accompanying illustration. This pattern is made in tea, table, dessert and coffee spoons; butter knife, sugar shell, berry spoon, dessert and medium forks, &c.



# Current Hardware Prices.

REVISED JANUARY 9, 1900.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33 $\frac{1}{2}$ @33 $\frac{1}{2}$ @10% signifies that the price of the goods in question ranges from 33 $\frac{1}{2}$  per cent. discount to 33 $\frac{1}{2}$  and 10 per cent. discount.

**Cut Prices.**—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3, 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters Blind-

Domestic,  $\frac{1}{2}$  doz. \$3.00...33 $\frac{1}{2}$ @33 $\frac{1}{2}$ @10%  
North's...10%  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent...25 $\frac{1}{2}$ @  
Taplin's Perfection...50%

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—American—

Eagle Anvil... $\frac{1}{2}$  B 7 $\frac{1}{2}$ @7 $\frac{1}{2}$ @  
Hay-Budden, Wrought... $\frac{1}{2}$  B 9 $\frac{1}{2}$ @  
Horseshoe brand, Wrought... $\frac{1}{2}$  B 9 $\frac{1}{2}$ @  
Samson... $\frac{1}{2}$  B 7 $\frac{1}{2}$ @  
Trenton, Wrought... $\frac{1}{2}$  B 8 $\frac{1}{2}$ @  
Buel Pat. Trenton Wrought... $\frac{1}{2}$  B 9 $\frac{1}{2}$ @  
Vulcan Wrought... $\frac{1}{2}$  B 8 $\frac{1}{2}$ @

## Imported—

Armitage's Mouse Hole...8 $\frac{1}{2}$ @9 $\frac{1}{2}$ @  
Peter Wright's...9 $\frac{1}{2}$ @9 $\frac{1}{2}$ @

## Anvil, Vise and Drill—

Millers Falls Co., \$18.00...20%

## Apple Parers—See Parers, Apple, &c.

## Aprons, Blacksmiths'—

Hull & Hoyt Co.:  
Lots of 1 doz...25%  
smaller Lots...20%  
Lots of 3 doz...30%

## Augers and Bits—

Com. Double Spur...70@70@5%

## Boring Machine Augers—

Car Bits, 12-in. twist...60@%  
Jennings' Pattern:  
Auger Bits...60@%  
Ford's Auger and Car Bits...40@10@40@10@10%

## Forstner Pat. Auger Bits—

C. E. Jennings & Co.:  
No. 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000, 1002, 1004, 1006, 1008, 1010, 1012, 1014, 1016, 1018, 1020, 1022, 1024, 1026, 1028, 1030, 1032, 1034, 1036, 1038, 1040, 1042, 1044, 1046, 1048, 1050, 1052, 1054, 1056, 1058, 1060, 1062, 1064, 1066, 1068, 1070, 1072, 1074, 1076, 1078, 1080, 1082, 1084, 1086, 1088, 1090, 1092, 1094, 1096, 1098, 1100, 1102, 1104, 1106, 1108, 1110, 1112, 1114, 1116, 1118, 1120, 1122, 1124, 1126, 1128, 1130, 1132, 1134, 1136, 1138, 1140, 1142, 1144, 1146, 1148, 1150, 1152, 1154, 1156, 1158, 1160, 1162, 1164, 1166, 1168, 1170, 1172, 1174, 1176, 1178, 1180, 1182, 1184, 1186, 1188, 1190, 1192, 1194, 1196, 1198, 1200, 1202, 1204, 1206, 1208, 1210, 1212, 1214, 1216, 1218, 1220, 1222, 1224, 1226, 1228, 1230, 1232, 1234, 1236, 1238, 1240, 1242, 1244, 1246, 1248, 1250, 1252, 1254, 1256, 1258, 1260, 1262, 1264, 1266, 1268, 1270, 1272, 1274, 1276, 1278, 1280, 1282, 1284, 1286, 1288, 1290, 1292, 1294, 1296, 1298, 1300, 1302, 1304, 1306, 1308, 1310, 1312, 1314, 1316, 1318, 1320, 1322, 1324, 1326, 1328, 1330, 1332, 1334, 1336, 1338, 1340, 1342, 1344, 1346, 1348, 1350, 1352, 1354, 1356, 1358, 1360, 1362, 1364, 1366, 1368, 1370, 1372, 1374, 1376, 1378, 1380, 1382, 1384, 1386, 1388, 1390, 1392, 1394, 1396, 1398, 1400, 1402, 1404, 1406, 1408, 1410, 1412, 1414, 1416, 1418, 1420, 1422, 1424, 1426, 1428, 1430, 1432, 1434, 1436, 1438, 1440, 1442, 1444, 1446, 1448, 1450, 1452, 1454, 1456, 1458, 1460, 1462, 1464, 1466, 1468, 1470, 1472, 1474, 1476, 1478, 1480, 1482, 1484, 1486, 1488, 1490, 1492, 1494, 1496, 1498, 1500, 1502, 1504, 1506, 1508, 1510, 1512, 1514, 1516, 1518, 1520, 1522, 1524, 1526, 1528, 1530, 1532, 1534, 1536, 1538, 1540, 1542, 1544, 1546, 1548, 1550, 1552, 1554, 1556, 1558, 1560, 1562, 1564, 1566, 1568, 1570, 1572, 1574, 1576, 1578, 1580, 1582, 1584, 1586, 1588, 1590, 1592, 1594, 1596, 1598, 1600, 1602, 1604, 1606, 1608, 1610, 1612, 1614, 1616, 1618, 1620, 1622, 1624, 1626, 1628, 1630, 1632, 1634, 1636, 1638, 1640, 1642, 1644, 1646, 1648, 1650, 1652, 1654, 1656, 1658, 1660, 1662, 1664, 1666, 1668, 1670, 1672, 1674, 1676, 1678, 1680, 1682, 1684, 1686, 1688, 1690, 1692, 1694, 1696, 1698, 1700, 1702, 1704, 1706, 1708, 1710, 1712, 1714, 1716, 1718, 1720, 1722, 1724, 1726, 1728, 1730, 1732, 1734, 1736, 1738, 1740, 1742, 1744, 1746, 1748, 1750, 1752, 1754, 1756, 1758, 1760, 1762, 1764, 1766, 1768, 1770, 1772, 1774, 1776, 1778, 1780, 1782, 1784, 1786, 1788, 1790, 1792, 1794, 1796, 1798, 1800, 1802, 1804, 1806, 1808, 1810, 1812, 1814, 1816, 1818, 1820, 1822, 1824, 1826, 1828, 1830, 1832, 1834, 1836, 1838, 1840, 1842, 1844, 1846, 1848, 1850, 1852, 1854, 1856, 1858, 1860, 1862, 1864, 1866, 1868, 1870, 1872, 1874, 1876, 1878, 1880, 1882, 1884, 1886, 1888, 1890, 1892, 1894, 1896, 1898, 1900, 1902, 1904, 1906, 1908, 1910, 1912, 1914, 1916, 1918, 1920, 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, 1940, 1942, 1944, 1946, 1948, 1950, 1952, 1954, 1956, 1958, 1960, 1962, 1964, 1966, 1968, 1970, 1972, 1974, 1976, 1978, 1980, 1982, 1984, 1986, 1988, 1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030, 2032, 2034, 2036, 2038, 2040, 2042, 2044, 2046, 2048, 2050, 2052, 2054, 2056, 2058, 2060, 2062, 2064, 2066, 2068, 2070, 2072, 2074, 2076, 2078, 2080, 2082, 2084, 2086, 2088, 2090, 2092, 2094, 2096, 2098, 2100, 2102, 2104, 2106, 2108, 2110, 2112, 2114, 2116, 2118, 2120, 2122, 2124, 2126, 2128, 2130, 2132, 2134, 2136, 2138, 2140, 2142, 2144, 2146, 2148, 2150, 2152, 2154, 2156, 2158, 2160, 2162, 2164, 2166, 2168, 2170, 2172, 2174, 2176, 2178, 2180, 2182, 2184, 2186, 2188, 2190, 2192, 2194, 2196, 2198, 2200, 2202, 2204, 2206, 2208, 2210, 2212, 2214, 2216, 2218, 2220, 2222, 2224, 2226, 2228, 2230, 2232, 2234, 2236, 2238, 2240, 2242, 2244, 2246, 2248, 2250, 2252, 2254, 2256, 2258, 2260, 2262, 2264, 2266, 2268, 2270, 2272, 2274, 2276, 2278, 2280, 2282, 2284, 2286, 2288, 2290, 2292, 2294, 2296, 2298, 2300, 2302, 2304, 2306, 2308, 2310, 2312, 2314, 2316, 2318, 2320, 2322, 2324, 2326, 2328, 2330, 2332, 2334, 2336, 2338, 2340, 2342, 2344, 2346, 2348, 2350, 2352, 2354, 2356, 2358, 2360, 2362, 2364, 2366, 2368, 2370, 2372, 2374, 2376, 2378, 2380, 2382, 2384, 2386, 2388, 2390, 2392, 2394, 2396, 2398, 2400, 2402, 2404, 2406, 2408, 2410, 2412, 2414, 2416, 2418, 2420, 2422, 2424, 2426, 2428, 2430, 2432, 2434, 2436, 2438, 2440, 2442, 2444, 2446, 2448, 2450, 2452, 2454, 2456, 2458, 2460, 2462, 2464, 2466, 2468, 2470, 2472, 2474, 2476, 2478, 2480, 2482, 2484, 2486, 2488, 2490, 2492, 2494, 2496, 2498, 2500, 2502, 2504, 2506, 2508, 2510, 2512, 2514, 2516, 2518, 2520, 2522, 2524, 2526, 2528, 2530, 2532, 2534, 2536, 2538, 2540, 2542, 2544, 2546, 2548, 2550, 2552, 2554, 2556, 2558, 2560, 2562, 2564, 2566, 2568, 2570, 2572, 2574, 2576, 2578, 2580, 2582, 2584, 2586, 2588, 2590, 2592, 2594, 2596, 2598, 2600, 2602, 2604, 2606, 2608, 2610, 2612, 2614, 2616, 2618, 2620, 2622, 2624, 2626, 2628, 2630, 2632, 2634, 2636, 2638, 2640, 2642, 2644, 2646, 2648, 2650, 2652, 2654, 2656, 2658, 2660, 2662, 2664, 2666, 2668, 2670, 2672, 2674, 2676, 2678, 2680, 2682, 2684, 2686, 2688, 2690, 2692, 2694, 2696, 2698, 2700, 2702, 2704, 2706, 2708, 2710, 2712, 2714, 2716, 2718, 2720, 2722, 2724, 2726, 2728, 2730, 2732, 2734, 2736, 2738, 2740, 2742, 2744, 2746, 2748, 2750, 2752, 2754, 2756, 2758, 2760, 2762, 2764, 2766, 2768, 2770, 2772, 2774, 2776, 2778, 2780, 2782, 2784, 2786, 2788, 2790, 2792, 2794, 2796, 2798, 2800, 2802, 2804, 2806, 2808, 2810, 2812, 2814, 2816, 2818, 2820, 2822, 2824, 2826, 2828, 2830, 2832, 2834, 2836, 2838, 2840, 2842, 2844, 2846, 2848, 2850, 2852, 2854, 2856, 2858, 2860, 2862, 2864, 2866, 2868, 2870, 2872, 2874, 2876, 2878, 2880, 2882, 2884, 2886, 2888, 2890, 2892, 2894, 2896, 2898, 2900, 2902, 2904, 2906, 2908, 2910, 2912, 2914, 2916, 2918, 2920, 2922, 2924, 2926, 2928, 2930, 2932, 2934, 2936, 2938, 2940, 2942, 2944, 2946, 2948, 2950, 2952, 2954, 2956, 2958, 2960, 2962, 2964, 2966, 2968, 2970, 2972, 2974, 2976, 2978, 2980, 2982, 2984, 2986, 2988, 2990, 2992, 2994, 2996, 2998, 3000, 3002, 3004, 3006, 3008, 3010, 3012, 3014, 3016, 3018, 3020, 3022, 3024, 3026, 3028, 3030, 3032, 3034, 3036, 3038, 3040, 3042, 3044, 3046, 3048, 3050, 3052, 3054, 3056, 3058, 3060, 3062, 3064, 3066, 3068, 3070, 3072, 3074, 3076, 3078, 3080, 3082, 3084, 3086, 3088, 3090, 3092, 3094, 3096, 3098, 3100, 3102, 3104, 3106, 3108, 3110, 3112, 3114, 3116, 3118, 3120, 3122, 3124, 3126, 3128, 3130, 3132, 3134, 3136, 3138, 3140, 3142, 3144, 3146, 3148, 3150, 3152, 3154, 3156, 3158, 3160, 3162, 3164, 3166, 3168, 3170, 3172, 3174, 3176, 3178, 3180, 3182, 3184, 3186, 3188, 3190, 3192, 3194, 3196, 3198, 3200, 3202, 3204, 3206, 3208, 3210, 3212, 3214, 3216, 3218, 3220, 3222, 3224, 3226, 3228, 3230, 3232, 3234, 3236, 3238, 3240, 3242, 3244, 3246, 3248, 3250, 3252, 3254, 3256, 3258, 3260, 3262, 3264, 3266, 3268, 3270, 3272, 3274, 3276, 3278, 3280, 3282, 3284, 3286, 3288, 3290, 3292, 3294, 3296, 3298, 3300, 3302, 3304, 3306, 3308, 3310, 3312, 3314, 3316, 3318, 3320, 3322, 3324, 3326, 3328, 3330, 3332, 3334, 3336, 3338, 3340, 3342, 3344, 3346, 3348, 3350, 3352, 3354, 3356, 3358, 3360, 3362, 3364, 3366, 3368, 3370, 3372, 3374, 3376, 3378, 3380, 3382, 3384, 3386, 3388, 3390, 3392, 3394, 3396, 3398, 3400, 3402, 3404, 3406, 3408, 3410, 3412, 3414, 3416, 3418, 3420, 3422, 3424, 3426, 3428, 3430, 3432, 3434, 3436, 3438, 3440, 3442, 3444, 3446, 3448, 3450, 3452, 3454, 3456, 3458, 3460, 3462, 3464, 3466, 3468, 3470, 3472, 3474, 3476, 3478, 3480, 3482, 3484, 3486, 3488, 3490, 3492, 3494, 3496, 3498, 3500, 3502, 3504, 3506, 3508, 3510, 3512, 3514, 3516, 3518, 3520, 3522, 3524, 3526, 3528, 3530, 3532, 3534, 3536, 3538, 3540, 3542, 3544, 3546, 3548, 3550, 3552, 3554, 3556, 3558, 3560

**Carpet Stretchers—**

See Stretchers, Carpet.

**Cartridges—**

B. B. Caps, Con., Ball Swgd.	.....\$1.30
B. B. Caps, Round Ball.	.....\$1.12 @ 1.18
<b>Blank Cartridges:</b>	
38 C. F., \$5.60.	.....10c5k
38 C. F., \$7.01.	.....10c5k
38 cal. Rim., \$1.50.	.....10c5k
38 cal. Rim., \$2.75.	.....10c5k
Central Fire.	.....2k
Pistol and Rifle.	.....15c5k
Primed Shells and Bullets.	.....15c5k
Rim Fire Sporting.	.....50k
Rim Fire, Military.	.....15c5k

**Casters—**

Bed.	.....70 @ 70c10k
Plate.	.....75 @ 75c10k
Philadelphia.	.....75 @ 75c10k
Boss Anti-Friction.	.....70k10k
Martin's Patent (Phoenix).	.....45k
Payson's Anti-Friction Furniture.	.....70k10k
Payson's Anti-Friction Truck.	.....70k10k
Standard Ball Bearing.	.....40k
Tucker's Patent, low list.	.....35k

**Cattle Leaders—**

See Leaders, Cattle.

**Chain—**

American Coil, Full Casks:	
5-16 1/4 5-16 3/4 7-16 1/4 9-16 1/4	.....75 @ 75c10k
7-16 3/4 9-16 3/4 11-16 3/4 13-16 3/4	.....75 @ 75c10k
11-16 3/4 13-16 3/4 15-16 3/4 17-16 3/4	.....75 @ 75c10k
15-16 3/4 17-16 3/4 19-16 3/4 21-16 3/4	.....75 @ 75c10k
19-16 3/4 21-16 3/4 23-16 3/4 25-16 3/4	.....75 @ 75c10k
23-16 3/4 25-16 3/4 27-16 3/4 29-16 3/4	.....75 @ 75c10k
27-16 3/4 29-16 3/4 31-16 3/4 33-16 3/4	.....75 @ 75c10k
31-16 3/4 33-16 3/4 35-16 3/4 37-16 3/4	.....75 @ 75c10k
35-16 3/4 37-16 3/4 39-16 3/4 41-16 3/4	.....75 @ 75c10k
39-16 3/4 41-16 3/4 43-16 3/4 45-16 3/4	.....75 @ 75c10k
43-16 3/4 45-16 3/4 47-16 3/4 49-16 3/4	.....75 @ 75c10k
47-16 3/4 49-16 3/4 51-16 3/4 53-16 3/4	.....75 @ 75c10k
51-16 3/4 53-16 3/4 55-16 3/4 57-16 3/4	.....75 @ 75c10k
55-16 3/4 57-16 3/4 59-16 3/4 61-16 3/4	.....75 @ 75c10k
59-16 3/4 61-16 3/4 63-16 3/4 65-16 3/4	.....75 @ 75c10k
63-16 3/4 65-16 3/4 67-16 3/4 69-16 3/4	.....75 @ 75c10k
67-16 3/4 69-16 3/4 71-16 3/4 73-16 3/4	.....75 @ 75c10k
71-16 3/4 73-16 3/4 75-16 3/4 77-16 3/4	.....75 @ 75c10k
75-16 3/4 77-16 3/4 79-16 3/4 81-16 3/4	.....75 @ 75c10k
79-16 3/4 81-16 3/4 83-16 3/4 85-16 3/4	.....75 @ 75c10k
83-16 3/4 85-16 3/4 87-16 3/4 89-16 3/4	.....75 @ 75c10k
87-16 3/4 89-16 3/4 91-16 3/4 93-16 3/4	.....75 @ 75c10k
91-16 3/4 93-16 3/4 95-16 3/4 97-16 3/4	.....75 @ 75c10k
95-16 3/4 97-16 3/4 99-16 3/4 101-16 3/4	.....75 @ 75c10k
99-16 3/4 101-16 3/4 103-16 3/4 105-16 3/4	.....75 @ 75c10k
103-16 3/4 105-16 3/4 107-16 3/4 109-16 3/4	.....75 @ 75c10k
107-16 3/4 109-16 3/4 111-16 3/4 113-16 3/4	.....75 @ 75c10k
111-16 3/4 113-16 3/4 115-16 3/4 117-16 3/4	.....75 @ 75c10k
115-16 3/4 117-16 3/4 119-16 3/4 121-16 3/4	.....75 @ 75c10k
119-16 3/4 121-16 3/4 123-16 3/4 125-16 3/4	.....75 @ 75c10k
123-16 3/4 125-16 3/4 127-16 3/4 129-16 3/4	.....75 @ 75c10k
127-16 3/4 129-16 3/4 131-16 3/4 133-16 3/4	.....75 @ 75c10k
131-16 3/4 133-16 3/4 135-16 3/4 137-16 3/4	.....75 @ 75c10k
135-16 3/4 137-16 3/4 139-16 3/4 141-16 3/4	.....75 @ 75c10k
139-16 3/4 141-16 3/4 143-16 3/4 145-16 3/4	.....75 @ 75c10k
143-16 3/4 145-16 3/4 147-16 3/4 149-16 3/4	.....75 @ 75c10k
147-16 3/4 149-16 3/4 151-16 3/4 153-16 3/4	.....75 @ 75c10k
151-16 3/4 153-16 3/4 155-16 3/4 157-16 3/4	.....75 @ 75c10k
155-16 3/4 157-16 3/4 159-16 3/4 161-16 3/4	.....75 @ 75c10k
159-16 3/4 161-16 3/4 163-16 3/4 165-16 3/4	.....75 @ 75c10k
163-16 3/4 165-16 3/4 167-16 3/4 169-16 3/4	.....75 @ 75c10k
167-16 3/4 169-16 3/4 171-16 3/4 173-16 3/4	.....75 @ 75c10k
171-16 3/4 173-16 3/4 175-16 3/4 177-16 3/4	.....75 @ 75c10k
175-16 3/4 177-16 3/4 179-16 3/4 181-16 3/4	.....75 @ 75c10k
179-16 3/4 181-16 3/4 183-16 3/4 185-16 3/4	.....75 @ 75c10k
183-16 3/4 185-16 3/4 187-16 3/4 189-16 3/4	.....75 @ 75c10k
187-16 3/4 189-16 3/4 191-16 3/4 193-16 3/4	.....75 @ 75c10k
191-16 3/4 193-16 3/4 195-16 3/4 197-16 3/4	.....75 @ 75c10k
195-16 3/4 197-16 3/4 199-16 3/4 201-16 3/4	.....75 @ 75c10k
199-16 3/4 201-16 3/4 203-16 3/4 205-16 3/4	.....75 @ 75c10k
203-16 3/4 205-16 3/4 207-16 3/4 209-16 3/4	.....75 @ 75c10k
207-16 3/4 209-16 3/4 211-16 3/4 213-16 3/4	.....75 @ 75c10k
211-16 3/4 213-16 3/4 215-16 3/4 217-16 3/4	.....75 @ 75c10k
215-16 3/4 217-16 3/4 219-16 3/4 221-16 3/4	.....75 @ 75c10k
219-16 3/4 221-16 3/4 223-16 3/4 225-16 3/4	.....75 @ 75c10k
223-16 3/4 225-16 3/4 227-16 3/4 229-16 3/4	.....75 @ 75c10k
227-16 3/4 229-16 3/4 231-16 3/4 233-16 3/4	.....75 @ 75c10k
231-16 3/4 233-16 3/4 235-16 3/4 237-16 3/4	.....75 @ 75c10k
235-16 3/4 237-16 3/4 239-16 3/4 241-16 3/4	.....75 @ 75c10k
239-16 3/4 241-16 3/4 243-16 3/4 245-16 3/4	.....75 @ 75c10k
243-16 3/4 245-16 3/4 247-16 3/4 249-16 3/4	.....75 @ 75c10k
247-16 3/4 249-16 3/4 251-16 3/4 253-16 3/4	.....75 @ 75c10k
251-16 3/4 253-16 3/4 255-16 3/4 257-16 3/4	.....75 @ 75c10k
255-16 3/4 257-16 3/4 259-16 3/4 261-16 3/4	.....75 @ 75c10k
259-16 3/4 261-16 3/4 263-16 3/4 265-16 3/4	.....75 @ 75c10k
263-16 3/4 265-16 3/4 267-16 3/4 269-16 3/4	.....75 @ 75c10k
267-16 3/4 269-16 3/4 271-16 3/4 273-16 3/4	.....75 @ 75c10k
271-16 3/4 273-16 3/4 275-16 3/4 277-16 3/4	.....75 @ 75c10k
275-16 3/4 277-16 3/4 279-16 3/4 281-16 3/4	.....75 @ 75c10k
279-16 3/4 281-16 3/4 283-16 3/4 285-16 3/4	.....75 @ 75c10k
283-16 3/4 285-16 3/4 287-16 3/4 289-16 3/4	.....75 @ 75c10k
287-16 3/4 289-16 3/4 291-16 3/4 293-16 3/4	.....75 @ 75c10k
291-16 3/4 293-16 3/4 295-16 3/4 297-16 3/4	.....75 @ 75c10k
295-16 3/4 297-16 3/4 299-16 3/4 301-16 3/4	.....75 @ 75c10k
299-16 3/4 301-16 3/4 303-16 3/4 305-16 3/4	.....75 @ 75c10k
303-16 3/4 305-16 3/4 307-16 3/4 309-16 3/4	.....75 @ 75c10k
307-16 3/4 309-16 3/4 311-16 3/4 313-16 3/4	.....75 @ 75c10k
311-16 3/4 313-16 3/4 315-16 3/4 317-16 3/4	.....75 @ 75c10k
315-16 3/4 317-16 3/4 319-16 3/4 321-16 3/4	.....75 @ 75c10k
319-16 3/4 321-16 3/4 323-16 3/4 325-16 3/4	.....75 @ 75c10k
323-16 3/4 325-16 3/4 327-16 3/4 329-16 3/4	.....75 @ 75c10k
327-16 3/4 329-16 3/4 331-16 3/4 333-16 3/4	.....75 @ 75c10k
331-16 3/4 333-16 3/4 335-16 3/4 337-16 3/4	.....75 @ 75c10k
335-16 3/4 337-16 3/4 339-16 3/4 341-16 3/4	.....75 @ 75c10k
339-16 3/4 341-16 3/4 343-16 3/4 345-16 3/4	.....75 @ 75c10k
343-16 3/4 345-16 3/4 347-16 3/4 349-16 3/4	.....75 @ 75c10k
347-16 3/4 349-16 3/4 351-16 3/4 353-16 3/4	.....75 @ 75c10k
351-16 3/4 353-16 3/4 355-16 3/4 357-16 3/4	.....75 @ 75c10k
355-16 3/4 357-16 3/4 359-16 3/4 361-16 3/4	.....75 @ 75c10k
359-16 3/4 361-16 3/4 363-16 3/4 365-16 3/4	.....75 @ 75c10k
363-16 3/4 365-16 3/4 367-16 3/4 369-16 3/4	.....75 @ 75c10k
367-16 3/4 369-16 3/4 371-16 3/4 373-16 3/4	.....75 @ 75c10k
371-16 3/4 373-16 3/4 375-16 3/4 377-16 3/4	.....75 @ 75c10k
375-16 3/4 377-16 3/4 379-16 3/4 381-16 3/4	.....75 @ 75c10k
379-16 3/4 381-16 3/4 383-16 3/4 385-16 3/4	.....75 @ 75c10k
383-16 3/4 385-16 3/4 387-16 3/4 389-16 3/4	.....75 @ 75c10k
387-16 3/4 389-16 3/4 391-16 3/4 393-16 3/4	.....75 @ 75c10k
391-16 3/4 393-16 3/4 395-16 3/4 397-16 3/4	.....75 @ 75c10k
395-16 3/4 397-16 3/4 399-16 3/4 401-16 3/4	.....75 @ 75c10k
399-16 3/4 401-16 3/4 403-16 3/4 405-16 3/4	.....75 @ 75c10k
403-16 3/4 405-16 3/4 407-16 3/4 409-16 3/4	.....75 @ 75c10k
407-16 3/4 409-16 3/4 411-16 3/4 413-16 3/4	.....75 @ 75c10k
411-16 3/4 413-16 3/4 415-16 3/4 417-16 3/4	.....75 @ 75c10k
415-16 3/4 417-16 3/4 419-16 3/4 421-16 3/4	.....75 @ 75c10k
419-16 3/4 421-16 3/4 423-16 3/4 425-16 3/4	.....75 @ 75c10k
423-16 3/4 425-16 3/4 427-16 3/4 429-16 3/4	.....75 @ 75c10k
427-16 3/4 429-16 3/4 431-16 3/4 433-16 3/4	.....75 @ 75c10k
431-16 3/4 433-16 3/4 435-16 3/4 437-16 3/4	.....75 @ 75c10k
435-16 3/4 437-16 3/4 439-16 3/4 441-16 3/4	.....75 @ 75c10k
439-16 3/4 441-16 3/4 443-16 3/4 445-16 3/4	.....75 @ 75c10k
443-16 3/4 445-16 3/4 447-16 3/4 449-16 3/4	.....75 @ 75c10k
447-16 3/4 449-16 3/4 451-16 3/4 453-16 3/4	.....75 @ 75c10k
451-16 3/4 453-16 3/4 455-16 3/4 457-16 3/4	.....75 @ 75c10k
455-16 3/4 457-16 3/4 459-16 3/4 461-16 3/4	.....75 @ 75c10k
459-16 3/4 461-16 3/4 463-16 3/4 465-16 3/4	.....75 @ 75c10k
463-16 3/4 465-16 3/4 467-16 3/4 469-16 3/4	.....75 @ 75c10k
467-16 3/4 469-16 3/4 471-16 3/4 473-16 3/4	.....75 @ 75c10k
471-16 3/4 473-16 3/4 475-16 3/4 477-16 3/4	.....75 @ 75c10k
475-16 3/4 477-16 3/4 479-16 3/4 481-16 3/4	.....75 @ 75c10k
479-16 3/4 481-16 3/4 483-16 3/4 485-16 3/4	.....75 @ 75c10k
483-16 3/4 485-16 3/4 487-16 3/4 489-16 3/4	.....75 @ 75c10k
487-16 3/4 489-16 3/4 491-16 3/4 493-16 3/4	.....75 @ 75c10k
491-16 3/4 493-16 3/4 495-16 3/4 497-16 3/4	.....75 @ 75c10k
495-16 3/4 497-16 3/4 499-16 3/4 501-16 3/4	.....75 @ 75c10k
499-16 3/4 501-16 3/4 503-16 3/4 505-16 3/4	.....75 @ 75c10k
503-16 3/4 505-16 3/4 507-16 3/4 509-16 3/4	.....75 @ 75c10k
507-16 3/4 509-16 3/4 511-16 3/4 513-16 3/4	.....75 @ 75c10k
511-16 3/4 513-16 3/4 515-16 3/4 517-16 3/4	.....75 @ 75c10k
515-16 3/4 517-16 3/4 519-16 3/4 521-16 3/4	.....75 @ 75c10k
519-16 3/4 521-16 3/4 523-16 3/4 525-16 3/4	.....75 @ 75c10k
523-16 3/4 525-16 3/4 527-16 3/4 529-16 3/4	.....75 @ 75c10k
527-16 3/4 529-16 3/4 531-16 3/4 533-16 3/4	.....75 @ 75c10k
531-16 3/4 533-16 3/4 535-16 3/4 537-16 3/4	.....75 @ 75c10k
535-16 3/4 537-16 3/4 539-16 3/4 541-16 3/4	.....75 @ 75c10k
539-16 3/4 541-16 3/4 543-16 3/4 545-16 3/4	.....75 @ 75c10k
543-16 3/4 545-16 3/4 547-16 3/4 549-16 3/4	.....75 @ 75c10k
547-16 3/4 549-16 3/4 551-16 3/4 553-16 3/4	.....75 @ 75c10k
551-16 3/4 553-16 3/4 555-16 3/4 557-16 3/4	.....75 @ 75c10k
555-16 3/4 557-16 3/4 559-16 3/4 561-16 3/4	.....75 @ 75c10k
559-16 3/4 561-16 3/4 563-16 3/4 565-16 3/4	.....75 @ 75c10k
563-16 3/4 565-16 3/4 567-16 3/4 569-16 3/4	.....75 @ 75c10k
567-16 3/4 569-16 3/4 571-16 3/4 573-16 3/4	.....75 @ 75c10k
571-16 3/4 573-16 3/4 575-16 3/4 577-16 3/4	.....75 @ 75c10k
575-16 3/4 577-16 3/4 579-16 3/4 581-16 3/4	.....75 @ 75c10k
579-16 3/4 581-16 3/4 583-16 3/4 585-16 3/4	.....75 @ 75c10k
583-16 3/4 585-16 3/4 587-16 3/4 589-16 3/4	.....75 @ 75c10k
587-16 3/4 589-16 3/4 591-16 3/4 593-16 3/4	.....75 @ 75c10k
591-16 3/4 593-16 3/4 595-16 3/4 597-16 3/4	.....75 @ 75c10k
595-16 3/4 597-16 3/4 599-16 3/4 601-16 3/4	.....75 @ 75c10k
599-16 3/4 601-16 3/4 603-16 3/4 605-16 3/4	.....75 @ 75c10k
603-16 3/4 605-16 3/4 607-16 3/4 609-16 3/4	.....75 @ 75c10k
607-16 3/4 609-16 3/4 611-16 3/4 613-16 3/4	.....75 @ 75c10k
611-16 3/4 613-16 3/4 615-16 3/4 617-16 3/4	.....75 @ 75c10k
615-16 3/4 617-16 3/4 619-16 3/4 621-16 3/4	.....75 @ 75c10k
619-16 3/4 621-16 3/4 623-16 3/4 625-16 3/4	.....75 @ 75c10k
623-16 3/4 625-16 3/4 627-16 3/4 629-16 3/4	.....75 @ 75c10k
627-16 3/4 629-16 3/4 631-16 3/4 633-16 3/4	.....75 @ 75c10k
631-16 3/4 633-16 3/4 635-16 3/4 637-16 3/4	.....75 @ 75c10k
635-16 3/4 637-16 3/4 639-16 3/4 641-16 3/4	.....75 @ 75c10k
639-16 3/4 641-16 3/4 643-16 3/4 645-16 3/4	.....75 @ 75c10k
643-16 3/4 645-16 3/4 647-16 3/4 649-16 3/4	.....75 @ 75c10k
647-16 3/4 649-16 3/4 651-16 3/4 653-16 3/4	.....75 @ 75c10k
651-16 3/4 653-16 3/4 655-16 3/4 657-16 3/4	.....75



**Gimlets—**

Nail, Metal, Assorted, gro. \$1.40 @ 1.75  
Spike, Metal, Assorted, gro. \$3.00 @ 3.50  
Nail, Wood Handled, Assorted, gro. \$4.00 @ 4.25  
Spike, Wood Handled, Assorted, gro. \$5.00 @ 5.25

**Glass, American Window**

Jobbers' List, Sept. 1, 1900.  
Small lots from store:  
Single Strength, all sizes... 25¢ @ 25¢  
Double Strength, all sizes... 35¢ @ 35¢  
10% to be added on all first quality, both Single and Double.

**Glue—Liquid, Fish—**

List A, Bottles or Cans, with Brush... 37¢ @ 50¢  
List B, Cans (½ pts., pts., qts.)... 33¢ @ 18¢  
List C, Cans (½ gal., gal.)... 25¢ @ 45¢

**Glue Pots—See Pots, Glue.**

**Grease, Axle—**

Common Grade... gro. \$5.00 @ 6.00  
Dixon's Everlasting... 10-lb pails, ea. 85¢  
Dixon's Everlasting, in bxs., 5 doz. 1 lb. \$1.30; 2 lb. \$2.00  
Snow Flake:  
1 qt. cans, per doz. \$2.00; 2 qt. \$3.30;  
1 gal. cans per doz. \$6.00; 5 gal. \$16.00; 5 gal. \$24.00

**Grindstone Fixtures—**

See Fixtures, Grindstone.

**Guards, Snow—**

Cleveland Wire Spring Co.:  
Galv. Steel # 1000... \$9.00  
Copper # 1000... \$18.00

**Gun Powder—See Powder.**

**Hack Saws—See Saws.**

**Hafts, Awl—**

Peg Patent, Leather Top... \$1.50 @ 1.75  
Peg Patent, Plain Top... \$3.50 @ 3.75  
Sewing, Brass Ferrule... \$1.50 @ 1.65  
Saddlers', Brass Ferrule... \$1.35 @ 1.45  
Peg, Common... \$1.25 @ 1.35  
Brad, Common... \$1.50 @ 1.75

**Halters and Ties—**

Covert Mfg. Co., Web... 45¢ @ 25¢  
Covert Mfg. Co., Jute Rope... 45¢ @ 25¢  
Covert Mfg. Co., Sisal Rope... 30¢ @ 25¢  
Covert's Saddlery Works, 90 list, W. B... 60¢ @ 10¢  
Covert's Saddlery Works, Leather 60¢ @ 10¢  
Covert's Saddlery Works, Jute... 60¢ @ 10¢  
Covert's Saddlery Works, Sisal... 60¢ @ 10¢  
Covert's Saddlery Works, Manila... 60¢ @ 10¢  
Covert's Saddlery Works, Cotton... 70¢ @ 10¢

**Hammers—**

**Handled Hammers—**

Heller's Machinists'... 50¢ @ 50¢  
Heller's Farriers... 50¢ @ 50¢  
Magnetite Tack, No. 1, 2, 3, \$1.35, \$1.50, \$1.75  
Pess, Stow & Wilcox... 40¢ @ 40¢  
Fayette R. Plumb:  
Plumb, A. E. Nail... 40¢ @ 40¢  
Engineers' and B. S. Hand... 60¢ @ 70¢  
Machinists' Hammers... 60¢ @ 70¢  
Riveting and Tinners'... 30¢ @ 50¢  
Sargent's C. S. New List... 45¢ @ 10¢

**Heavy Hammers and Sledges—**

3 lb. and under... lb. 45¢  
3 to 5 lb... lb. 50¢ @ 10¢ @ 30¢  
Over 5 lb... lb. 30¢ @ 10¢ @ 50¢  
Wilkinson's Smiths'... 50¢ @ 10¢ lb.

**Handcuffs and Leg Irons**

See Police Goods.

**Handles—**

**Agricultural Tool Handles—**

Hoe Rake, Fork, &c... 60¢ @ 60¢  
Shovel, &c, Wood D Handle... 50¢ @ 50¢

**Cross-Cut Saw Handles—**

Atkins... 40¢ @ 50¢  
Champion... 45¢ @ 45¢  
Dixson's... 50¢ @ 50¢

**Mechanics' Tool Handles—**

Auger, assorted... gro. \$2.40 @ \$3.00  
Auger, large... gro. \$3.85 @ \$3.00  
Bradawl... gro. \$1.25 @ \$1.50  
Chisel Handles:  
Apple Tanged Firmer, gro. ass'd... \$2.25 @ \$2.50; large, \$3.50 @ \$2.00.  
Hickory Tanged Firmer, gro. ass'd... \$1.75 @ \$2.30; large, \$3.50 @ \$3.70.  
Apple Socket Firmer, gro. ass'd... \$1.70 @ \$1.85; large, \$3.00 @ \$2.25.  
Hickory Socket Firmer, gro. ass'd... \$1.60 @ \$1.75; large, \$1.75 @ \$3.00.  
Hickory Socket Framing, gro. ass'd... \$3.50 @ \$2.75; large, \$2.65 @ \$3.85.  
File, assorted... gro. \$1.00 @ \$1.15.  
Hammer, Hatchet, Axe, &c... 60¢  
Hand Saw, Varnished, doz. 70¢ @ 75¢  
Not Varnished... 50¢ @ 60¢  
Plane Handles:  
Jack, doz. 20¢ @ 25¢; Jack Bolted... 55¢ @ 60¢  
Fore, doz. 35¢ @ 38¢; Fore, Bolted... 70¢ @ 75¢

**Hangers—**

Barn Door, New Pattern, Round Groove, Regular:  
Inch... 3 4 5 6 8  
Doz... \$0.85 1.30 1.60 1.95 2.45  
Barn Door, New England Pattern, Check Back, Round Groove, Regular:  
Inch... 3 4 5 6  
Doz... \$1.45 1.90 2.55 3.10

Chicago Spring Butt Co.:  
Friction... 25¢  
Oscillating... 25¢  
Big Twin... 25¢  
Chisholm & Moore Mfg. Co.:  
Baggage Car Door... 50¢  
Elevator... 40¢  
Railroad... 55¢  
Coleman Hardware Mfg. Co.:  
Car Ball Bearing, ½ doz. pair \$7.50  
No. 10 Roller Bearing, doz. pr. 5.50  
No. 20 Roller Bearing, doz. pr. 4.50  
Nickel... 50¢  
J. G. C... 50¢ @ 10¢  
Cronk Hanger Co.:  
Loose Axle... 60¢  
Roller Bearing... 60¢ @ 10¢  
Lane Bros.:  
Parlor, Standard... \$3.25  
Parlor, New Model... \$3.75  
Barn Door, Standard... 60¢ @ 10¢  
Covered... 50¢ @ 10¢ @ 10¢  
Special... 60¢ @ 10¢  
Lawrence Bros.:  
Advance... 60¢  
Cleveland... 60¢ @ 10¢  
Crown... 60¢  
New York... 60¢  
Po-Rless... 60¢ @ 10¢  
Sterling... 60¢  
McKinney Mfg. Co.:  
No. 2, Standard, 18... 60¢ @ 10¢  
No. 1, Special, 18... 60¢ @ 10¢  
Stowell Mfg. and Foundry Co.:  
Atlas... 60¢  
Baggage Car Door... 50¢  
Climax Anti-Friction... 40¢  
Elevator... 40¢  
Interstate... 50¢ @ 10¢  
Magic... 50¢  
Matchless... 60¢ @ 10¢  
Nansen... 60¢ @ 10¢  
Parlor Door... 60¢ @ 10¢  
Railroad... 50¢ @ 10¢  
Street Car Door... 50¢ @ 10¢  
Steel, No. 300, 400, 500... 40¢ @ 15¢  
Zenith for Wood Track... 50¢ @ 10¢  
Taylor & Boggis Foundry Co.:  
Kiddie's... 50¢ @ 50¢ @ 10¢  
Van Wagener & Williams Hdw Co.:  
American Trackless... 33¢ @ 10¢  
Wilcox Mfg. Co.:  
Bike Roller Bearing... 60¢ @ 10¢  
C. J. Roller Bearing... 60¢ @ 10¢  
Cycle Ball Bearing... 50¢  
Dart Ball Bearing... 40¢  
Ives, Wood Track... 60¢ @ 10¢  
L. T. Roller Bearing... 60¢ @ 10¢  
New Era Roller Bearing... 50¢ @ 10¢  
O. K. Roller Bearing... 60¢ @ 10¢  
Prindle, Wood Track... 60¢  
Richards' Wood Track... 60¢  
Richards' Steel Track... 30¢ @ 10¢  
Superior Roller Bearing... 60¢ @ 10¢  
Tandem Nos. 1 and 2... 60¢  
Underwriters' Roller Bearing... 60¢  
Wilcox Auditorium Ball Bearing... 20¢  
Wilcox Barn Trolley No. 123... 40¢  
Fire Trolley, Roller Bearing... 30¢  
Wilcox Le Roy Noiseless Ball Bearing... 40¢  
Wilcox New Century... 30¢ @ 10¢ @ 10¢  
Wilcox Trolley Ball Bearing... 40¢

**Harness Menders—See Menders.**

**Harness Snaps—See Snaps.**

**Hasps—**

McKinney's Perfect Hasp # 408 10¢ @ 10¢  
Wrought Hasps, Staples, &c—See Wrought Goods.

**Hatchets—**

Best Brands... 40¢ @ 10¢ @ 50¢  
Cheaper Brands... 50¢ @ 10¢ @ 50¢  
Note.—Net prices often made.

**Hay and Straw Knives—**

See Knives.

**Hinges—**

**Blind and Shutter Hinges—**

Surface Gravity Locking Blind:  
(Victor; National; 1838 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo).  
No... 1 2 3 5  
Doz pair... \$0.75 1.45 2.90  
Mortise Shutter:  
(L. & P. O. S., Dixie, &c).  
No... 1 2 3 5  
Doz pair... \$0.60 1.25 2.50  
Mortise Reversible Shutter, (Buffalo, &c).  
No... 1 2 3 5  
Doz pair... \$0.65 1.30 2.55

**Parquet—**

North's Automatic Blind Fixtures, No. 2, for Wood, \$0.00; No. 3, for Brick, \$1.50.  
Reading's Gravity... 75¢ @ 10¢  
Sargent's, No. 1, 3, 5... 60¢ @ 10¢  
Sargent's, No. 11 & 13... 70¢ @ 10¢  
Wrightsville Hardware Co.:  
O. S. Lull & Porter... 80¢ @ 25¢  
Acme, Lull & Porter... 75¢ @ 10¢  
Queen City Reversible... 75¢ @ 10¢  
Stenger's Positive Locking, Nos. 1 & 3... 70¢ @ 10¢  
Shepard's Noiseless, Nos. 9, 60, 65... 70¢ @ 10¢  
Niagara, Gravity Locking, No. 1, 3 & 5... 75¢ @ 10¢  
1908, Old Pat'n. Nos. 1, 3 & 5... 75¢ @ 10¢  
Tip Pat'n. Nos. 1, 3 & 5... 75¢ @ 10¢  
Buffalo Gravity Locking, No. 1, 3 & 5... 75¢ @ 10¢  
Shepard's Double Locking, Nos. 2 & 25... 70¢ @ 10¢  
Champion Gravity Locking, No. 75... 75¢ @ 10¢  
Steamboat Gravity Locking, No. 10... 75¢ @ 10¢  
Pioneer, No. 60, 45 & 55... 75¢ @ 10¢  
Empire, No. 101 & 103... 70¢ @ 10¢  
W. H. Co.'s Mortise Gravity Locking, No. 2... 60¢ @ 10¢

**Stanley's Steel Gravity Blind Hinges,**

# doz. sets \$1.30... 30¢ @ 10¢

**Gate Hinges—**

Clark's or Shepard's—Doz. sets:  
No... 1 2 3  
Hinges with Latches \$1.90 2.50 3.45  
Hinges only... 1.30 1.90 2.90  
Latches only... 0.65 0.65 0.95

**New England:**

With Latch... doz... \$1.50 @ 1.75  
Without Latch... doz... \$1.25 @ 1.50

**Reversible Self-Closing:**

With Latch... doz... \$1.30 @ 1.50  
Without Latch... doz... \$1.15 @ 1.35

**Western:**

With Latch... doz... \$1.40 @ 1.75  
Without Latch... doz... \$0.95 @ 1.30

Wrightsville Hardware Co.:  
Shepard's or Clark's, Nos. 1 & 2... 2.65 @ 2.95  
Shepard's or Clark's, No. 3... 55¢ @ 55¢

**Spring Hinges—**

Holdback, Cast Iron, gro. \$2.00 @ 2.25  
Non-Holdback, Cast Iron... gro. \$6.75 @ 7.25

J. Bardley  
Bardley's Patent Checking... 15¢  
Bommer Bros.:  
Bommer's... 33¢ @ 45¢  
Chicago Spring Butt Co.:  
Chicago... 20¢  
Floor Hinge... 40¢  
Garden City Engine House... 20¢  
Keene's Saloon Door... 30¢  
Triple End... 40¢  
Coleman Hdw. Co.:  
Champion Holdback... # gr. \$10.00  
J. G. C... # gr. \$9.50  
Nickel... # gr. \$9.00  
Lawson Mfg. Co.:  
March ss... 30¢  
Matchless Pivot... 35¢  
Payson Mfg. Co.:  
Oblique, Dbl. Acting... 50¢ @ 50¢  
Stover W. Co.:  
Ideal, No. 16, Detachable, # gr... \$12.50  
Ideal, No. 4... # gr. \$9.00  
New Idea No. 1... # gr. \$9.00  
New Ideas, Double Acting... 45¢  
Van Wagener & Williams Hdw. Co.:  
Acme, Wrt. Steel... 80¢  
Acme, Brass... 80¢  
American... 30¢  
Columbia, No. 14... # gr. \$9.00  
Columbia, No. 18... # gr. \$25.00  
Columbia, Adjustable... 50¢  
Gem, new list... 25¢  
Clover Leaf... # gr. \$12.50  
Oxford new list... 25¢

**Wrought Iron Hinges—**

Strap and T Hinges, &c., list Mar. 15, 1899:  
Light Strap Hinges... 66¢ @ 66¢  
Heavy Strap Hinges... 70¢ @ 70¢  
Light T Hinges... 50¢ @ 1 3  
Heavy T Hinges... 60¢ @ 10¢  
Extra Heavy T Hinges... Extra 66¢ @ 25¢ @ 10¢ @ 25¢ @ 10¢  
Hinge Hasps... lb. 25¢ @ 10¢  
Cor. Heavy Strap... 70¢ @ 5¢  
Cor. Ex. Heavy T... 66¢ @ 3 6 to 12 in. lb. 2 3/4 @ 3 c  
Screw Hook... 15 to 20 in. lb. 2 3/4 @ 3 3/4 c  
and Strap... 22 to 36 in. lb. 3 3/4 @ 3 3/4 c  
Screw Hook and Eye:  
3/4 to 1 inch... lb. 5 3/4 @ 6 c  
1/2-inch... lb. 6 3/4 @ 7 c  
1/4-inch... lb. 8 3/4 @ 9 c

**Hods, Coal—**

Galv. Open... \$2.05 2.20 2.45 3 65 # doz.  
Jap. Open... \$1.55 1.70 1.85 2.05 # doz.  
Galv. Funnel... \$2.75 2.90 3.10 3 45 # doz.  
Jap. Funnel... \$2.00 2.15 2.35 2.70 # doz.

**Hoes—**

**Scovill and Oval Pattern—**

Grub. list Feb. 23, 1899... 60¢ @ 50¢ @ 10¢ @ 55¢  
D. & H. Scovill... 65¢ @ 55¢ @ 10¢ @ 35¢

**Handled—**

Sept. 1, 1900, List:  
Field and Garden... 75¢ @ 25¢  
Ladies', Boys', Toy and Onion... 70¢ @ 10¢ @ 10¢  
Street and Mortar... 75¢ @ 7 3/4 @ 25¢  
Cotton... 70¢ @ 10¢ @ 10¢ @ 5¢ @ 25¢  
Planters... 70¢ @ 10¢  
Weeding... 70¢  
Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.  
Ft. Madison Crucible Garden Hoe... 75¢ @ 35¢  
Ft. Madison Crescent Cultivator Hoe... per doz... 75¢ @ 10¢ @ 25¢  
Ft. Madison Mattock Hoes... # doz. \$4.50  
Junior Size... # doz. \$4.00  
Ft. Madison Sprouting Hoe... # doz. \$4.80  
Ft. Madison Dixie Tobacco Hoe... 75¢ @ 50¢  
Kretzinger's Cut Easy, per doz... 75¢ @ 35¢  
Warren Hoe... 60¢  
W. & C. Ivanhoe... 75¢ @ 35¢  
B. B. Cultivator Hoe... 75¢ @ 10¢  
Acme Weeding... 75¢ @ 10¢  
W. & C. Lightning Shovel Hoe... # doz. \$5.50

**Hog Rings and Ringers—**

See Rings and Ringers.

**Hoisting Apparatus—**

See Machines, Hoisting.

**Hollow Ware—**

See Ware, Hollow.

**Holders—**

Bit—  
Angular, # doz. \$34.00... 45¢ @ 10¢  
C. E. Jennings & Co. Model Tool Holders... 33¢ @ 45¢  
Nicholson File Holders and File Handles... 33¢ @ 45¢

**Hooks—**

**Cast Iron—**

Bird Cage, Reading... 50¢ @ 10¢ @ 60¢  
Bird Cage, Sargent's List... 50¢ @ 10¢ @ 60¢  
Clothes Line, Sargent's List... 40¢ @ 10¢  
Clothes Line, Stowell's... 40¢ @ 10¢  
Clothes Line, Reading List... 65¢ @ 10¢ @ 65¢ @ 10¢ @ 10¢

**Coat and Hat, Stowell's... 70¢**

Coat and Hat, Reading... 70¢ @ 75¢  
Coat and Hat, Sargent's List... 45¢ @ 10¢  
Coat and Hat, Wrightsville... 65¢ @ 10¢  
Harness, Reading List... 70¢ @ 10¢ @ 75¢

**Wire—**

Atlas, Coat and Hat... 80¢  
Single Cases... 45¢  
10 Case Lots... 45¢ @ 10¢  
Car Harness... 50¢ @ 10¢ @ 45¢  
Wire Coat and Hat... 50¢ @ 10¢ @ 55¢  
Acme... 50¢ @ 10¢ @ 55¢  
V Brace, Chief and Car... 50¢ @ 10¢ @ 55¢  
Gem... 60¢  
Bright Wire Goods—See Wire.

**Wrought Iron—**

Box, 6 in., per doz. \$1.50; 8 in., \$1.75; 10 in., \$2.00.  
Cotton... doz. \$1.05 @ 1.15  
Wrought Staples, Hooks, &c... See Wrought Goods.

**Miscellaneous—**

Bush, Light, doz. \$5.50; Medium, \$6.00; Heavy, \$6.50.  
Grass... Nos. 1 2 3 4  
Best... \$1.50 1.75 2.00  
Common... \$1.50 1.60 1.75  
Potato and Manure... lb. 1 3/4  
Whiffletree... lb. 1 3/4  
Hooks and Eyes:  
Brass... 60¢ @ 10¢ @ 10¢ @ 70¢  
Malleable Iron... 70¢ @ 10¢ @ 10¢  
Covert Saddlery Works' Self Locking Gate and Door Hook... 60¢ @ 10¢  
Crown Picture... 50¢ @ 10¢  
Bench Hooks—See Bench Stops.  
Corn Hooks—See Knives, Corn.

**Horse Nails—See Nails, Horse**

**Horse Shoes—**

See Shoes, Horse.

**Hose Rubber—**

Garden Hose, 3/4-inch:  
Competition... ft. 1 3/4 @ 1 3/4  
2-ply Standard... ft. 5 @ 6 c  
4-ply Standard... ft. 8 @ 9 c  
2-ply extra... ft. 9 @ 10 c  
4-ply extra... ft. 11 @ 12 c  
Cotton Garden, 3/4-in., coupled:  
Low Grade... ft. 6 @ 7 c  
Fair quality... ft. 8 @ 9 c

**Irons—**

From 1 to 10... lb. 3 @ 3 1/2  
B. B. Sad Irons... lb. 3 1/2 @ 4 c  
Chinese Laundry... lb. 5 @ 5 1/2  
Chinese Sad... lb. 3 1/2 @ 3 1/2  
Mrs. Potts' per set:  
Nos. 50 55 60 65  
70c 60c 80c 70c  
New England Pressing, lb. 5 1/4 @ 3 1/2

**Soldering—**

Soldering Coppers, 1 & 1 1/4 lb., 21 c  
25c; 3 lb., 19 c 21c  
Covert Mfg. Co... 20¢ @ 25¢

**Pinking—**

Pinking Irons... doz. 50¢ @ 60¢

**Jack Screws—See Screws.**

**Jacks, Wagon—**

Covert Mfg. Co., Steel... 45¢ @ 25¢  
Daisy... 40¢ @ 40¢ @ 10¢  
Victor... 60¢  
Lane's Steel... 40¢

**Kettles—**

Brass, Spun, Plain... 20¢ @ 25¢  
Enameled and Cast Iron—See Ware, Hollow.

**Knife Sharpeners—**

See Sharpeners, Knife.

**Knives—**

**Butcher, Shoe, &c.—**

Dick's Butcher Knives... 40¢  
Foster Bros' Butcher, &c... 80¢  
Nichols' Butcher Knives... 50¢  
Hay and Straw—See Hay Knives.

**Corn—**

Pt. Madison Cut-Easy, # doz... \$3.25  
Withington Acme, # doz. \$2.65; Dent, \$2.75; Adj. Serrated, \$2.20; Serrated, \$2.10; Yankee No. 1, \$1.50; Yankee No. 2, \$1.15.

**Drawing—**

Standard List... 70¢ @ 50¢ @ 70¢ @ 10¢  
Adjustable Handle... 25¢ @ 31 1/2¢  
Bradley's... 35¢  
C. E. Jennings & Co. Nos. 45, 46... 40¢ @ 10¢  
Jennings & Griffin... 70¢ @ 10¢ @ 55¢  
Watrous... 30¢ @ 10¢ @ 40¢  
L. & J. White... 20¢ @ 25¢  
Cantelo's Folding... 50¢ @ 50¢ @ 55¢

**Hay and Straw—**

Iwan's Sickle Edge... # doz. \$11.50  
Lightning... \$7.50  
Maine... # doz. \$8.50

**Mining—**

Buffalo... # doz. \$15.00  
Smith's, # doz. Single, \$2; Double, \$3 45¢ @ 50¢

**Miscellaneous—**

Farriers'... doz. \$3.00 @ 5.00  
Wostenholm's... # doz. \$3.00 @ 3.25

**Knobs—**

Base, 2 1/4-inch, Birch, or Maple, Rubber tip, gro... \$1.25 @ 1.40  
Carriage, Jap. all sizes... gro. 30¢ @ 33¢  
Door, Mineral... doz. 60¢ @ 65¢  
Door, For Jap d... doz. 70¢ @ 75¢  
Door, For Nickel... doz. \$2.00 @ 2.10  
Bardley's Wood Door, Shutter, &c... 15¢  
Picture, Sargent's... 60¢ @ 10¢  
Snow's Victor... 50¢ @ 10¢

**Ladders, Step—**

Handy Ladder Works:  
Extended Shipped Shipped  
Length. Length. Ready for K. D.  
Feet.



**Ladies—Melting—**

L. & G. Mfg. Co. .... 60%  
P., S. & W. .... 40@40.10%  
Reading ..... 50@10%  
Sargent's ..... 40@40.10%

**Lanterns—Tubular—**

Regular Tubular ..... doz. \$4.50@5.00  
Side Lift Tubular ..... doz. \$4.75@5.25  
Square Lift Tubular ..... doz. \$4.75@5.25  
Other Styles ..... 40@10@40@10@5%

**Bull's Eye Police—**

No. 1, 3/4 inch ..... \$3.60  
No. 2, 3 inch ..... \$4.00

**Latches, Thumb—**

Roggin's Latches ..... doz. \$2@3.50

**Lawn Mowers—**

See Mowers, Lawn.

**Leaders, Cattle—**

Small ..... doz. 45c; large, 55c  
Covert Mfg. Co. .... 45@25

**Lemon Squeezers—**

See Squeezers, Lemon.

**Lifters, Transom—**

Dickson:  
3 x 4 ft. x 1/4 ..... \$100 \$11.00  
Other sizes, iron ..... 70@10%  
Other sizes, Brass and Bronze ..... 70%

**Lines—**

Wire Clothes, Nos. 18 19 20  
75 feet ..... \$2.00 \$3.00 1.65  
100 feet ..... \$1.80 1.70 1.30

**Oceanic Mills—**

Crown Solid Braided Chalk ..... 33%  
Mason's, No. 0 to No. 5 ..... 33%  
Samson Cordage Works:  
Solid Braided Chalk, No. 0 to 3 ..... 40%  
Silver Lake Braided Chalk, No. 0, 25.00;  
No. 1, 25.50; No. 2, 27.00; No. 3, 27.50  
5 gr. .... 30%

**Locks—**

Cabinet—  
Cabinet Locks ..... 33%@33%@7%  
Door Locks, Latches, &c.—  
[Net prices are very often made on these goods.]

Reading Hardware Co. .... 40%  
R. & E. Mfg. Co. .... 50%  
Sargent & Co. .... 40@40.10%  
Slaymaker-Barry Co. .... 30@35%  
Snow's Victor ..... 50@10%

**Elevator—**

Stowell's ..... 33%  
Padlocks—  
Wrought Iron, list Dec. 3, '97, 75@10%  
Dog Collar, S. B. Co. .... 40%  
R. & E. Mfg. Co. Wrt. Steel and Brass 50%  
S. B. & Co. .... 40%

**Sash, &c.—**

Fitch's Bronze and Brass ..... 60%  
Fitch's Iron ..... 70%  
Ives' Patent ..... 55@60%  
Oelinger's Automatic ..... 50%  
Payson's Perfect ..... 70%  
Payson's Signal (new list) ..... 75%  
Reading ..... 60@10@10@70%

**Machines—**

Boring—  
Without Augers.  
Upright. Angular.  
Improved No. 3 ..... \$4.25 No. 1 \$4.50  
Improved No. 4 ..... 3.75 No. 2 3.38  
Improved No. 5 ..... 2.75  
Jennings ..... 2.50 3.00  
Miller's Falls ..... 2.75  
Snell's, Rice's Pat. 2.50  
Swan's, No. 500 ..... 6.10 No. 200 6.45

**Holisting—**

Moore's Anti-Friction Differential Pulley Block ..... 30%  
Moore's Hand Hoist, with Lock Brake, 20%

**Ice Cutting—**

Chandler's ..... 15%

**Washing—**

Wayne American ..... \$38.00  
Western Star, No. 2, \$28.00  
Western Star, No. 3, \$30.00  
St. Louis, No. 41, \$30.00

**Maillets—**

Hickory ..... 45@50@55%  
Lignumvitae ..... 45@50@55%  
Timbers, Hickory and Applewood, doz. 60@55c  
Fiber Head Stearns ..... 30@10%

**Mats—**

Elastic Steel (W. G. Co.) ..... 10%

**Mattocks—**

See Picks and Mattocks.

**Meat Cutters—**

See Cutters, Meat.

**Milk Cans—**

See Cans, Milk.

**Mill—**

Box and Side, list Jan. 1, '98, 60@10@50@55%

**Net prices are often made on goods which are lower than above discounts.**

Enterprise Mfg. Co. .... 25@30%  
National, list Jan. 1, '94, 30%  
Parker's Columbia and Victor ..... 50@10@50%

**Parer's Box and Side—**

Swift, Lane Bros. .... 30%

**Mining Knives—**

See Knives, Mining.

**Molasses Gates—**

See Gates, Molasses.

**Money Drawers—**

See Drawers, Money.

**Mowers, Lawn—**

Net prices are generally quoted.

Cheap ..... all sizes, \$2.00@2.10  
Good ..... all sizes, \$2.50@3.75

High Grade 4.25 4.50 4.75 5.00  
Pennsylvania and Continental 5.00@10.5%  
Quaker City ..... 70@5%  
Great American ..... 70@5%  
Philadelphia:  
Style M., S., C., K., T. .... 70@5%  
Style A., all Steel ..... 60@10%  
Style E., Low Wheel ..... 60@10%  
Style E., High Wheel ..... 70@10.5%  
Drexel and Gold Coin, low list ..... 50@5%

**Nails—**

Cut and Wire. See Trade Report.

Wire Nails and Brads, Papered.  
List July 20, 1899, 85@85@10%  
Hungarian, Finishing, Upholsterers, &c. See Tacks.

**Horse—**

Nos. 7 8 9 10  
A. C. .... 25c 23c 22c 21c 20c 40@5%  
Ausable ..... 25c 23c 22c 21c 20c 50@10%  
Capwell ..... 19c 18c 17c 16c 15c 10@5%  
C. B. K. .... 25c 23c 22c 21c 20c 40%  
Champion ..... 25c 23c 22c 21c 20c 40@5@2%

Clinton ..... 19c 17c 16c 15c 14c 50@10@5%  
Maud S. .... 25c 23c 22c 21c 20c 50%  
Neponset ..... 23c 21c 20c 19c 18c 40%  
Putnam ..... 23c 21c 20c 19c 18c 33%  
Standard ..... 23c 21c 20c 19c 18c 40%  
Star ..... 23c 21c 20c 19c 18c 35@5%  
Vulcan ..... 23c 21c 20c 19c 18c 29@10%  
American, Nos. 1 to 10 ..... 25@10%

**Picture**

1 1/2 x 3 1/2 3 3/4 x 4 1/2  
Brass Head, 45 60 70 95 1.00 gro.  
Por. Head, 1.10 1.20 1.10 1.00 gro.

**Nippers, See Pliers and Nippers.****Nut Crackers—**

See Crackers, Nut.

**Nuts—**

List Feb. 1, '99.  
Cold Punched Off  
Mfrs. or U. S. Standard, list.  
Hexagon, plain ..... 5.80@5.90c  
Square, plain ..... 5.60@5.60c  
Square, C. T. & R. .... 5.60@5.70c  
Hexagon, C. T. & R. .... 6.40@6.50c

**Hot Pressed:**

Mfrs., U. S. or Nar. Gauge Stan'd.  
Square Blank or Tapped, 5.50@5.50c  
Hexagon Blank or Tapped 50@6.00c

**Oakum—**

Best or Government ..... lb. 6 1/4c  
Navy ..... lb. 5 c  
U. S. Navy ..... lb. 5 1/4c  
Plumbers' Spun Navy ..... 5 1/4c  
In carload lots 1/4 lb. off f.o.b. New York.

**Oil, Axle—**

Snow Flake:  
1 pt. cans, per doz. .... \$3.00  
1 qt. cans, per doz. .... \$4.80  
1 gal. cans, per doz. .... \$15.00  
5 gal. cans, per doz. .... \$66.00 33%@10%

**Oil Tanks—See Tanks, Oil.****Oilers—**

Brass and Copper ..... 40@10@50%  
Tin or Steel ..... 60@10@65%  
Zinc ..... 60@10@65%  
Malleable, Hammers Improved, No. 1, \$3.60; No. 2, \$4; No. 3, \$4.40 per doz. 50%  
Malleable, Hammers Old Pattern, same list, 50@10%  
Wilnot & Hobbs Mfg. Co.:  
Spring Bottom Cans ..... 70@70@10%  
Railroad Oilers etc. .... 60@60@10%

**Openers—**

Can—  
French ..... doz. 35c  
Iron Hawk ..... doz. 35@7c  
Sprague, Iron Hawk, per doz. 85@40c  
Sardine Scissors, doz. \$1.75@5.00  
T. P. Tool, per doz. \$1.75  
National, 5 gr. .... \$1.75@2.00  
Stowell's ..... per doz. 40@45c  
Waldorf, 5 gr. .... \$9.00

**Egg—**

Nickel Plate ..... per doz., \$2.00  
Silver Plate ..... per doz., \$4.00

**Packing—**

Rubber—  
Standard, fair quality ..... 70@10@75%  
Inferior quality ..... 75@10@80%  
Extra ..... 80@5@60@10@5%  
Jenkins' Standard, 5 gr. .... 25@35@5%

**Miscellaneous—**

American Packing ..... 20@10c lb.  
Cotton Packing ..... 15@11c lb.  
Italian Packing ..... 10@11c lb.  
Jute ..... 5@5 1/2c lb.  
Russia Packing ..... 12@13c lb.

**Pails—**

Creamery—  
S. S. & Co., with gauges, No. 1 \$0.50;  
No. 2, \$0.75 per doz.

**Galvanized—**

Prices per gro.  
Inch ..... 10 12 14  
Water, Regular ..... 18.00 21.00 24.00  
Water, Heavy ..... 22.00 25.00 28.00  
Fire, Rd. Bottom, 31.00 33.00 35.00  
Well ..... 27.00 29.00 31.00

**Pans—**

Dripping—  
Standard List ..... 65@10@45%

**Fry—**

Common Lipped:  
No. 1 2 3 4 5  
Per doz. \$0.50 .75 .85 .95 1.15

**Roasting and Baking—**

Regal, S. S. & Co., 5 doz. Nos. 5 \$4.50;  
10 \$5.00; 20 \$5.50; 30 \$6.00  
Simplex, 5 gr. No. 40 \$30.00; 50,  
\$34.50; 60 \$39.00; 140, \$33.00; 150,  
\$37.50; 160, \$43.00.

**Paper—**

Building Paper—  
Per roll  
Rosin Sized Sheathing: 500 sq. ft.  
Light wt., 20 sq. ft. to lb. \$0.40@0.45  
Medium wt., 12 sq. ft. to lb. .... \$0.60@0.65  
Heavy wt., extra quality, \$0.95@1.05  
Medium Grades Water Proof  
Sheathing ..... \$0.80@1.15  
Deafening Felt, 3, 6 and 1 1/2 sq. ft. to lb., ton ..... \$10.00  
York Haven Waterproof Sheathing ..... \$1.35@1.75

**Tarred Paper.**

1 ply (roll 500 sq. ft.), ton ..... \$28.00  
2 ply, roll 100 sq. ft. .... 50@55c  
3 ply, roll 100 sq. ft. .... 75@80c

**Sand and Emery—**

List Dec. 23, 1899, 50@10@50@10@10%  
see Trade Report.

**Parers—**

Apple—  
Advance ..... doz. \$4.50  
Baldwin ..... doz. \$5.00  
Bonanza ..... each \$5.00  
Dandy ..... each \$7.50  
Eureka, 1898 ..... each \$18.00  
Family Boy ..... doz. \$12.00  
Hudson's Little Star ..... doz. \$4.00  
Hudson's Rocking Table ..... doz. \$5.50  
Improved Bay State ..... doz. \$27.00@30.00  
New Lightning ..... doz. \$5.50  
Reading 79 ..... doz. \$4.00  
Reading 78 ..... doz. \$7.00  
Turn Table 98 ..... doz. \$5.50  
White Mountain ..... doz. \$4.00

**Potato—**

Saratoga ..... doz. \$5.50  
White Mountain ..... doz. \$4.50

**Picks and Mattocks—**

List Feb. 23, 1899, 75@75@10%

**Pinking Irons—**

See Irons, Pinking.

**Pins—**

Escutcheon—  
Brass ..... 60@10%  
Iron, list Nov. 11, '98, 60@10%

**Pipe, Cast Iron Soil—**

Factory Shipments.  
Standard, 2-6 in. .... 70@70@5%  
Extra Heavy, 2-6 in. .... 75@75@5%  
Fittings ..... 75@10@50%  
NOTE.—Freight allowances on Carload lots.

**Pipe, Merchant, Boiler**

Tubes, &c.—  
Carloads to Consumers.  
Merchant Pipe.  
Black. Galva-  
nized.  
1/4 to 1/2 inch ..... 61% 43%  
3/4 to 10 inch ..... 63% 58%  
Boiler Tubes.  
Up to 22 feet and over.  
Steel. 22 feet and over.  
1 to 1 1/2 inch and 3/4 in. 49% 44%  
1 1/2 to 2 1/4 inch ..... 45% 39%  
2 1/4 to 15 inch ..... 57% 52%  
Iron.  
1 to 1 1/2 inch and 3/4 in. 49% 44%  
1 1/2 to 2 1/4 inch ..... 45% 39%  
2 1/4 to 15 inch ..... 57% 52%  
Casing, Cut Lengths, S. & S.  
3/4 to 1 inch ..... 58%  
3/4 to 1 1/2 inch ..... 65%  
1 1/2 to 15 1/2 inch ..... 65%  
NOTE.—The old list is still used by some jobbers, and net prices are often quoted.

**Planes and Plane Irons—**

Wood Planes—  
Molding ..... 40@2 1/2@40@5%  
Bench, First quality ..... 45@10@45@10@5%  
Bench, Second quality ..... 60@10@50@10@5%  
Bailey's (Stanley R. & L. Co.) 50@10@50@10@10%  
Gage Self Setting ..... 35%

**Iron Planes—**

Bailey's (Stanley R. & L. Co.) 50@10@50@10@10%  
Chaplin's Iron Planes ..... 50@10@50@10@10%  
Miscellaneous Planes (Stanley R. & L. Co.) 25@10@25@10@10%  
Sargent's ..... 50@10@10%

**Plane Irons—**

Wood Bench Plane Irons, 35@35@5%  
Butcher's ..... 30%  
Butcher's, 5 gr. .... \$5.00@5.25@2  
Stanley R. & L. Co. 50@10@50@10@10%  
L. & J. White ..... 30@5@25%

**Planters, Corn, Hand.**

Kohler's Eclipse ..... \$3.00

**Plates—**

Felloe ..... lb. 3 1/2@4c  
Self-Sealing Pie Plates (S. S. & Co.), \$  
doz. \$2.00 ..... 50%

**Pliers and Nippers—**

Button Pliers ..... 65@10@70@10%  
Gas Burner, per doz., 5 in., \$1.15@  
\$1.90; 6 in., \$1.35@1.45  
Gas Pipe, 7 8 10 12-in.  
\$1.75 \$2.00 \$2.75 \$3.75

**Some Nippers..... 40@40.5%**

Bernard's:  
Parallel Pliers, &c. .... 35%  
Paragon Pliers ..... 50@5%  
Lodi Pliers ..... 50@5%  
Elm City Fence Pliers ..... 35%  
Cronk Hanger Co.:  
Cronk's ..... 60%  
Improved Button ..... 70@5%  
Stub's ..... 50%  
Combination and others ..... 35%  
Heller's Farriers' Nippers, Pinchers  
and Tools 50@50@5%  
Morrill's Parallel, 5 doz. \$12.00, 30@5%  
P., S. & W. Cast Steel ..... 30@10@40%  
P., S. & W. Tinnars' Cutting Nippers, 40@40@5%

Swedish Slide, End and Diagonal Cutting Pliers ..... 50%  
Utica Drop Forge & Tool Co.:  
Pliers and Nippers, all kinds ..... 40%

**Plumbs and Levels—**

Plumbs and Levels ..... 70@10@75@5%

Davis Iron, Machinist Nos. 1 to 40 ..... 40%  
Davis Iron, Adjustable Nos. 6 to 49 ..... 35%  
Dialton's ..... 70%  
Pocket Levels ..... 75@10@10@75@10%  
Stanley R. & L. Co. 70@10@70@10@10%  
Stanley's Duplex ..... 25@10@25@10@10%  
Woods' Extension ..... 59@5%

**Poachers, Egg—**

Buffalo Steam Egg Poachers, 5 doz., No. 1, \$7.20; No. 2, \$11.00 No. 3, \$11.00; No. 4, \$14.50 ..... 60%

**Points, Glaziers—**

Bulk and 1 lb. papers, lb. 9 1/4@10 c  
1/4-lb. papers ..... lb. 10 @10 1/2  
1/2-lb. papers ..... lb. 10 1/2@11 c

**Pokes, Animal—**

Ft. Madison Hawkeye ..... doz. \$3.25  
Ft. Madison, Western ..... doz. \$3.75

**Police Goods—**

Manufacturers' Lists ..... 55@55@5%

**Polish—Metal—**

Prestoline Liquid, No. 1 (1/2 pt.), doz. \$3.00; No. 2 (1 qt.), \$9.75 ..... 40%  
Prestoline Paste ..... 33%@40%  
U. S. Metal Polish Paste, 3 oz. boxes, doz. 50c; 5 gr. \$4.50; 1/2 oz. boxes, doz. \$1.25; 1 lb. boxes, doz. \$2.25.  
U. S. Liquid, 3 oz. cans, doz. \$1.25; 5 gr. \$12.00.  
Barkeepers' Friend Metal Polish, 5 gr. \$1.75; 5 gr. \$18.00.  
Wynn's White Silk, 1/2 pt. cans, doz. \$1.50

**Stove—**

Black Eagle Bensine Paste, 5 lb. cans ..... \$10  
Black Eagle, Liquid, 1/2 pt. cans ..... doz. 75c  
Black Jack Paste, 1/2 lb. cans, 5 gr. \$9.00  
Ladd's Black Beauty, 5 gr. \$10.00 ..... 50%  
Joseph Dixon's, 5 gr. \$5.75 ..... 10%  
Dixon's Plumbago ..... 5 gr. \$2.50  
Firestone ..... 5 gr. \$2.50  
Gem, 5 gr. \$4.50 ..... 10%  
Japanese ..... 5 gr. \$3.50  
Jet Black ..... 5 gr. \$3.50  
Peerless Iron Enamel, 1/2 pt. cans ..... doz. \$1.50

**Wynn's Black Silk, 5 lb. pails, 50c**

Wynn's Black Silk, 1/2 lb. box, doz. \$1.00  
Wynn's Black Silk, 5 oz. box, doz. \$0.75  
Wynn's Black Silk, 1/2 pt. liq., doz. \$2.00

**Poppers, Corn—**

Round or Square:  
1 qt. .... gro. \$7.00@7.50  
1 1/2 qt. .... gro. 9.50@10.00  
2 qt. .... gro. 10.50@11.00

**Post Hole and Tree Augers and Diggers—**

See also Diggers, Post Hole, &c.

**Potato Parers—**

See Parers, Potato.

**Pots—**

Glue—  
Enameled ..... 40@10@50%  
Tinned ..... 40@10@50%

**Powder—**

In Canisters:  
Duck, 1 lb. each ..... 45c  
Fine Sporting, 1 lb. each ..... 75c  
Rifle, 1/2 lb. each ..... 15c  
Rifle, 1 lb. each ..... 25c

**In Kegs:**

Duck, 6 1/2-lb. kegs ..... \$2.25  
Duck, 12 1/2-lb. kegs ..... \$4.25  
Duck, 25-lb. kegs ..... \$6.50  
Rifle, 6 1/2-lb. kegs ..... \$1.25  
Rifle, 12 1/2-lb. kegs ..... \$2.25  
Rifle, 25-lb. kegs ..... \$4.00

**King's Smokeless Shot**





**Shovels and Tongs—**

Brass Head.....60¢50¢@60¢10¢  
Iron Head.....60¢50¢@60¢10¢

**Sieves and Sifters—**

Hunter's Imitation, gro. \$11.00@12.00  
Buffalo Metallic Blue, S. S. & Co., gr.:  
14x16 16x18 18x20  
\$12.00 \$13.80 \$15.00  
Eclipse.....gr. \$10.00  
Electric Light.....gr. \$12.00  
Hunter's Genuine.....gr. \$12.50  
Shaker (Barber's Pat.) Flour Sifters.....  
per doz., \$2.00.....90¢

**Sieves, Tin Rim—**

Per dozen.  
Inch.....14 16 18 20  
Black, full size.....\$0.95 .98 1.00 1.10  
Plated, full size.....\$1.05 1.05 1.10 1.20  
Black, scant.....\$0.78 .80 .85

**Sieves, Wooden Rim—**

Nested, 10, 11 and 12 Inch.  
Mesh 20, Nested, doz.....\$0.75@0.80  
Mesh 20, Nested, doz......85@.90  
Mesh 24, Nested, doz.....1.00@1.05

**Sinks—**

Cast Iron.....60¢@60¢10¢  
NOTE.—There is not entire uniformity  
in lists used by jobbers.

**Wrought Steel—**

Columbus Galv'd and Enamelled.....60¢5¢  
L. & G. Mfg. Co., Galvanized.....50¢  
L. & G. Mfg. Co., Enamelled.....50¢

**Skins, Wagon—**

Cast Iron.....70¢@10¢75¢  
Malleable Iron.....40¢@10¢50¢  
Steel.....40¢@10¢10¢

**Slates—**

"D" Slates.....50¢@10¢50¢10¢10¢  
Unexcelled Noiseless Slates.....  
60¢@10¢50¢60¢10¢50¢  
Wire Bound.....40¢@10¢50¢  
Double Slates, add \$1 case, net.

**Slaw Cutters—See Cutters.****Slicers, Vegetable—**

Sterling \$2.00.....33¢4¢

**Snaps, Harness—**

German.....40¢@10¢10¢  
Covert Mfg. Co.:  
Derby.....35¢2¢  
High Grade.....45¢2¢  
Jockey.....45¢2¢  
Trojan.....45¢2¢  
Yankee.....35¢2¢  
Yankee, Roller.....30¢2¢

Covert's Saddlery Works:  
Banner.....60¢10¢  
Crown.....60¢10¢  
Model.....60¢10¢  
Triumph.....60¢10¢  
W. & E. T. Fitch Co.:  
Bristol.....40¢10¢  
Empire.....50¢5¢  
German.....40¢5¢  
National.....50¢5¢  
Perfect.....45¢  
Clipper.....50¢5¢  
Champion.....40¢  
Security.....40¢  
Victor.....60¢5¢

Onelida Community:  
Sol d Steel.....65¢@5¢10¢  
Solid 3 wire.....65¢@10¢10¢  
Sargent's Patent Guarded.....60¢@10¢

**Snaths—**

Scythe.....55¢5¢

**Snips, Tanners'—See Shears.****Soldering Irons—**

See Irons, Soldering.

**Spoke Trimmers—**

See Trimmers, Spoke.

**Spoons and Forks—**

Silver Plated—

Flat Ware.....50¢@10¢60¢10¢

Wm. Rogers Mfg. Co.....50¢10¢

**Miscellaneous—**

German Silver.....60¢10¢

Wm. Rogers Mfg. Co.:  
18% German Silver.....60¢  
Rogers' Silver Metal.....50¢10¢

**Springs—**

Door—

Gem (Coll.).....90¢  
Star (Coll.).....30¢  
Torrey's Rod, 30 in.....\$1.10@1.25  
Victor (Coll.).....50¢@10¢10¢

**Carriage, Wagon, &c.**

Factory Shipments.

14 in and wider.....Blk. Hf. Brt. Brt.  
4 1/4 4 1/2 4 3/4 4 1/2

Cliff's Bolster Springs.....30¢  
Cliff's Seat Springs.....pair 55¢

**Sprinklers, Lawn—**

Enterprise.....25¢30¢

Philadelphia No. 1, per doz. \$12; No. 2,  
\$15; No. 3, \$14.....30¢

**Squares—**

Nickel plated.....List Jan. 5, 1900

Steel and Iron.....7¢@75¢

Rosewood Hdl. Try Square and T-Bevels.....  
60¢@10¢10¢70¢

Iron Hdl. Try Squares and T-Bevels.....  
40¢@10¢10¢10¢

Dixon's Try Sq. and T-Bev. 1/4.....60¢10¢  
Winterbottom's Try and Miter.....50¢10¢

**Squeezers—**

Lemon—

Wood, Common, gro., No. 6, \$5.25  
@ \$5.50; No. 1, \$6.25@ \$6.50.

Wood, Porcelain Lined:  
Cheap.....doz. \$1.00@2.75

Good Grade.....doz. \$3.00@5.50  
Tinned Iron.....doz. \$0.75@1.35  
Iron, Porcelain Lined doz. \$1.90@3.35  
Jennings' Star.....doz. \$1.85@1.90  
Klug.....doz. \$2.00

**Staples—**

Barbed Blind.....lb. 8 1/4@8 1/2¢  
Electricians', Association list, 7¢@10¢  
Fence Staples, same price as Barbed  
Wire. See Trade Report.  
Poultry Netting, Staples... per lb. 4¢@4 1/4¢  
Grand Crossing Tack Co.'s list.....80¢10¢

**Steels, Butchers'—**

Dick's.....40¢  
Foster Bros.....30¢  
C. & A. Hoffmann's.....40¢  
Nichols Bros.....50¢

**Steelyards.....25¢@25¢10¢****Stocks and Dies—**

Blacksmiths'.....40¢@10¢10¢  
Gardner Die Stocks No. 1.....50¢  
Gardner Die Stocks, larger sizes.....40¢  
Green River.....25¢  
Lighting Screw Plate.....25¢  
Little Giant.....25¢  
Reece's New Screw Plates.....25¢30¢  
Curtis Reversible Ratchet Die Stock.....25¢

**Stone—****Scythe Stones—**

Chicago Wheel & Mfg. Co.:  
Gem Corundum, 10 inch, \$10.80 per  
gro., 12 inch, \$12.00  
Cleveland Stone Co., list Nov. '92, 33¢4¢  
Pike Mfg. Co., list '95-'96.....33¢4¢

**Oil Stones, &c.**

Chicago Wheel & Mfg. Co.:  
Corundum Oil, Double Grit.....50¢  
Corundum Are Stones, Slips, etc.....50¢  
Pike Mfg. Co.:  
Hindustan No. 1, per lb. 8¢  
Sand Stone.....5¢  
Turkey Oil Stone, Extra.....33¢4¢  
5 to 8 in.....33¢4¢10¢  
Turkey Slips.....\$1.50  
Lily White Washita.....60¢4¢  
Rosa Red Washita.....60¢4¢  
Washita Stone, Extra.....50¢  
Washita Stone, No. 1.....40¢  
Washita Stone, No. 2.....30¢  
Lily White Slips.....90¢  
Rosa Red Slips.....90¢  
Washita Slips, No. 1.....70¢  
Arkansas Stone, No. 1, 3 to 5 in, \$2.35  
Arkansas Stone, No. 1, 5 to 8 in, \$3.50  
India Oil Stones.....25¢  
Tanite Mills:  
Emery Oil, per doz. \$5.00.....50¢60¢

**Stoners—****Cherry—**

Enterprise.....25¢30¢

**Stops, Bench—**

Millers Falls.....15¢10¢  
Morrill's... per doz., No. 1, \$10.00; No. 2,  
\$11.00, 40¢20¢

**Stops, Window—**

Ives' Patent.....\$5¢5¢  
Wilcox, Steel, per doz., \$0.00.....50¢

**Stove Boards—**

See Boards, Stove.

**Stove Polish—See Polish, Stove.****Strainers, Pump—**

Diamond Joe Pump Strainers, per doz. 75¢

**Straps, Box—**

Cary's Universal case lots.....90¢10¢

**Stretchers, Carpet—**

Cast Iron, Steel Points.....doz. 55¢65¢

Socket.....doz. \$1.75

**Stuffers, Sausage—**

Miles' Challenge, per doz. \$90.....50¢50¢5¢  
Enterprise Mfg. Co.....25¢35¢7¢  
National Specialty Mfg. Co., list Jan.  
1, '97.....30¢

**Tacks Brads, &c.—**

List Jan. 15, '99.

Carpet Tacks, American.....50¢50¢

American Cut Tacks.....60¢30¢

Suedes Iron Tacks.....50¢40¢

Suedes Upholsterers' Tacks.....50¢40¢

Gimp Tacks.....50¢40¢

Lace Tacks.....50¢40¢

Trimmers' Tacks.....50¢30¢

Looking Glass Tacks.....70¢10¢

Bill Posters' and Railroad Tack.....50¢10¢

Hungarian Nails.....80¢25¢

Common and Patent Brads, 70¢10¢

Trunk and Clout Nails.....80¢10¢

NOTE.—The above prices are for  
straight weights. An extra 5¢ is given  
Star Weights and an extra 10¢ on  
Standard Weights.

**Miscellaneous—**

Double Point Tacks.....90¢6¢ or 7¢

Steel Wire Brads, R. & E. Mfg.  
Co.'s list.....50¢10¢60¢

See also Nails, Wire.

**Tanks, Oil—**

Emerald, S. S. & Co.....30-gal. \$3.20

Emerald, S. S. & Co.....60-gal., \$4.00

Queen City S. S. & Co., 70-gal., \$5.50

Queen City S. S. & Co., 60-gal., \$4.25

**Tapes, Measuring—**

American Assees' Skin.....40¢10¢50¢

Patent Leather.....25¢@20¢5¢

Steel.....40¢@10¢5¢

Chesterman's.....25¢@25¢5¢  
Eddy's Steel.....40¢40¢5¢  
Eddy's Metallic.....33¢@33¢25¢  
Keuffel & Esser Co., Steel and Metallic,  
Lower list, 1899.....35¢  
Lufkin's Steel.....33¢@35¢  
Lufkin's Metallic.....30¢@30¢25¢

**Thermometers—**

Tin Case.....80¢@90¢10¢

**Ties, Bale—Steel.**

Standard Wire.....50¢10¢5¢

**Ties, Wall—**

Cleveland Wire Spring Co.:  
Galv. St el 5 3/2 x 4 1/2 in. # 1000, \$10.00  
Galv. Steel 5 3/2 x 8 1/2 in. # 1000, \$11.00  
Galv. Steel 5 3/2 x 1 1/2 in. # 000, \$12.00  
Galv. Steel 5 3/2 x 1 1/2 in. # 1000, \$14.00

**Tinners' Shears, &c.—**

See Shears, Tinners', &c.

**Tinware—**

Stamped, Japanned and Placed, sold  
very generally at net prices.

**Tire Benders, Upsetters,**

&c.—See Benders and Upset-

ters, Tire

**Tobacco Cutters—**

See Cutters, Tobacco.

**Tools—****Coopers'—**

L. & I. J. White.....20¢@20¢5¢

**Saw—**

Atkins' new list.....40¢

Simonds' Improved.....33¢4¢

Simonds' Crescent.....25¢

**Ship—**

L. & I. J. White.....25¢

**Transom Lifters—**

See Lifters, Transom.

**Traps—Game—**

Oneida Pattern.....70¢10¢75¢10¢

Newhouse.....45¢50¢

Hawley & Norton.....65¢5¢70¢

Victor (Oneida Pattern).....75¢75¢10¢

Star (Blake Pattern).....65¢10¢70¢5¢

**Mouse and Rat—**

Mouse, Wood, Choker, doz. holes... 8¢4¢

Mouse, Round or Square Wire.....  
doz. \$0.85@1.00

Diamond Joe Mouse Traps.....per doz. 60¢

Diamond Joe Rat Traps.....per doz. \$1.00

Marty French Rat and Mouse Traps  
(Genuine):  
No. 1, Rat, Each \$1.19¢; per doz. \$12.00  
No. 3, Rat, per doz. \$6.00; case of 50  
\$5.25 doz.  
No. 3 1/2, Rat, per doz. \$1.75; case of 75  
\$4.25 doz.  
No. 4, Mouse, per doz. \$3.50; case of 75  
\$3.75 doz.  
No. 5, Mouse, per doz. \$2.75; case of 75  
\$3.25

Schuyler's Rat Killer, No. 1, per gr. \$30.00;  
No. 2, per gr. \$30.00; Mouse, No. 3,  
\$18.00.....50¢

**Fly—**

Balloon, Globe or Acme.....  
doz. \$1.15@1.25; gro. \$12.00@14.00

Harper, Champion or Paragon.....  
doz. \$1.25@1.50; gro. \$13.50@15.00

**Trimmers, Spoke—**

Bonney's Nos. 1 and 2.....40¢

Skarns.....25¢

**Trowels—**

Dixton Brick and Point'ng.....30¢

Dixton Plastering.....25¢

Dixton "Standard Brand" and Gar-

den Trowels.....40¢

Never-Break Steel Garden Trowels.....  
gro. \$7.00

Peace's Plastering.....30¢

Rose Brick and Plastering.....25¢5¢

Woodrugh & McFarlin, Plastering.....25¢10¢

**Trucks, Warehouse, &c.—**

R. & L. Block Co.'s list.....40¢

Daisy Stove Trucks, Improved pattern  
per doz. \$21.00

Model Stove Trucks.....per doz. \$18.50

**Tubs, Wash—**

No. 1 2 3

Galvanized, per doz. \$5.00 5.50 6.00

Galvanized Wash Tubs (S. S. & Co.):  
No. 1 2 3 10 20 30

Per doz. \$5.25 6.00 6.75 6.50 7.25 8.00

**Twine—****Miscellaneous—**

Flax Twine— BC B.

No. 9, 14 and 1/2-lb. Balls.....20¢ 20¢

No. 12, 14 and 1/2-lb. Balls.....18¢ 21¢

No. 18, 14 and 1/2-lb. Balls.....16¢ 19¢

No. 24, 14 and 1/2-lb. Balls.....15¢ 18¢

No. 28, 14 and 1/2-lb. Balls.....15¢ 18¢

Chalk Line, Cotton, 1/2-lb. Balls.....  
22¢@22¢1/2¢

Cotton Mops, 6, 9, 12 and 15 lb. to  
doz.....7¢@8¢

Cotton Wrapping, 5 Balls to lb.....  
10¢4¢@.

American 2-Ply Hemp, 1/4 and 1/2-lb.  
Balls.....12¢@13¢

American 3-Ply Hemp, 1-lb. Balls.....  
12¢@13¢

India 2-Ply Hemp, 1/4 and 1/2-lb.  
Balls (Spring Twine).....9¢

India 3-Ply Hemp, 1-lb. Balls.....9¢

India 3-Ply Hemp, 1/4-lb. Balls..... 8¢  
2, 3, 4 and 5-Ply Jute, 1/2-lb. Balls.....  
10¢@10¢1/2¢  
Mason Line, Linen, 1/2-lb. Balls.....45¢  
No. 26 Mattress, 1/4 and 1/2-lb. Balls.....57¢  
Wool.....7¢

**Vises—**

Solid Box.....50¢

Bonney's Saw Vises.....40¢10¢

**Parallel—**

Athol Machine Co.:  
Simpson's Adjustable.....40¢

Standard.....40¢

Amateur.....20¢

Bonney's.....40¢10¢

Fisher & Norris Double Screw.....15¢10¢

Holland's:  
Machinists'.....40¢

Key-stone.....70¢

Lewis Tool Co.....20¢30¢

Massey's Perfect.....15¢20¢

<b>Washers—</b>	
<b>Leather, Axle—</b>	
Solid.....	90¢10¢10¢85¢
Patent.....	85¢10¢85¢80¢
Coil:	
110 1 1/4 1 3/4 1 1/2	
<b>Iron or Steel—</b>	
Size bolt.....	5-16 3/4 1/2 5/8 3/4
Washers.....	\$5.00 4.70 3.10 3.20 3.00
In lots less than one keg add 1/4¢ per lb., 5-lb. boxes add 1/4¢ to list.	
<b>Cast Washers—</b>	
Over 1/2 inch, barrel lots, per lb.....	1 1/4¢1 3/4¢
<b>Washer Cutters—</b>	
See Cutters, Washer.	
<b>Washing Machines—</b>	
See Machines, Washing.	
<b>Water Coolers—</b>	
See Coolers, Water.	
<b>Weaners—</b>	
Tyler's New Heater—No. 1 7 doz. \$3.45; No. 2 \$3.70; No. 3 \$4.00; No. 4 \$4.30	
Tyler's Safety—Nos. 1 and 2, 7 doz. \$1.70; No. 3, \$2.00; No. 4, \$2.30.	
<b>Wedges—</b>	
Oil Finish.....	lb. 3 1/4¢

<b>Weights, Sash—</b>	
Eastern prices.....	\$20.00 to \$25.50
Western prices.....	\$17.00 to \$18.00
<b>Well Buckets, Galvanized</b>	
See Pails, Galvanized.	
<b>Wheels Well—</b>	
8-in., \$1.65 to \$1.75; 10-in., \$2.00 to \$2.10; 12-in., \$2.50 to \$2.75; 14-in., \$3.25 to \$3.40	
<b>Wire and Wire Goods—</b>	
Brt. and Ann., 6 to 9.....	70¢10¢
Brt. and Ann., 10 to 12.....	75¢10¢
Brt. and Ann., 13 to 15.....	75¢10¢
Brt. and Ann., 16 to 18.....	75¢10¢
Cop'd and Galv., 6 to 9.....	60¢10¢
Cop'd and Galv., 10 to 12.....	70¢10¢
Cop'd and Galv., 13 to 15.....	70¢10¢
Cop'd and Galv., 16 to 18.....	70¢10¢
Cop'd and Galv., 19 to 22.....	70¢10¢
Cop'd and Galv., 23 to 26.....	70¢10¢
Tinned, 6 to 9.....	70¢10¢
Tinned, 10 to 12.....	70¢10¢
Tinned, 13 to 15.....	70¢10¢
Tinned, 16 to 18.....	70¢10¢
Tinned, 19 to 22.....	70¢10¢
Tinned, 23 to 26.....	70¢10¢
Annealed Wire on Spools.....	70¢10¢
Brass and Copper Wire on Spools.....	60¢10¢
Brass, list Feb. 20, '98.....	\$25

Copper, list Feb. 20, '98.....	15¢
Cast Steel Wire.....	50¢
Stub's Steel Wire.....	\$6.00 to \$2.40
Wire Clothes Line, see Lines	
Wire Picture Cord, see Cord	
<b>Bright Wire Goods—</b>	
Iron and Brass, list July 1, 1899.....	85¢10¢
<b>Wire Cloth and Netting—</b>	
Galvanized Wire Netting, 30¢10¢85¢	
Painted Screen Cloth per 100 ft.....	\$1.00 to \$1.05
<b>Light Hardware Grade:</b>	
2-3 Mesh, Plain (Sc. list) sq. ft.....	1 1/4¢
2-3 Mesh, Galv. (Sc. list) sq. ft.....	1 3/4¢
<b>Wire Barb—See Trade Report.</b>	
<b>Wire, Rope—See Rope, Wire.</b>	
<b>Wrenches—</b>	
Agricultural.....	70¢10¢
Case lots.....	75¢10¢
Baxter's S.....	60¢10¢
Cox's Gen'l.....	40¢10¢
Cox's Mechanics.....	40¢10¢
Aome.....	60¢10¢
Alligator.....	60¢10¢

<b>Bemis &amp; Call's:</b>	
Adjustable S.....	35¢5¢
Adjustable S Pipe.....	40¢
Brigg's Pattern.....	30¢10¢
Combination Black.....	40¢5¢
Combination Bright.....	40¢
Cylinder or Gas Pipe.....	55¢
Extra Heavy.....	45¢
Merrick's Pattern.....	50¢
No. 3 Pipe, Bright.....	55¢
Bindley Automatic.....	30¢
Barman's.....	35¢
Bull Dog, W. & E.....	100¢10¢
Donohue's Engineer.....	40¢10¢
Eagle.....	50¢10¢
Gem Pocket.....	30¢
Hercules.....	70¢
Solid Handles, P. S. & W.....	50¢10¢
Stevenson.....	60¢10¢
<b>Wrought Goods—</b>	
Staples, Hooks, &c., list March 17 '98.....	85¢10¢
<b>Yokes, Neck—</b>	
Covert Saddlery Works, Trimmed.....	1.60¢5¢
Covert Saddlery Works, Neck Yoke Centers.....	70¢
<b>Yokes, Ox, and Ox Bows—</b>	
Fort Madison's Farmers & Freighters.....	list net
<b>Zinc—</b>	
Sheet.....	lb. 5 1/4¢ to 7¢

## PAINTS, OILS AND COLORS.—Wholesale Prices.

<b>White Lead, Zinc, &amp;c.</b>	
Lead, Foreign white, in Oil.....	7 1/4¢ 9 1/4¢
Lead, American White, in Oil:	
Lots of 500 lb or over.....	6 1/4¢
Lots less than 500 lb.....	7¢
Lead, White, in Oil, 25 lb tin	
pails, add to keg price.....	1/4¢
Lead, White, in Oil, 12 1/2 lb tin	
pails, add to keg price.....	1¢
Lead, White, in Oil, 1 to 5 lb assorted tins, add to keg price.....	1 1/4¢
Lead, White, Dry in bbls.....	5 1/4¢ 6¢
Lead, American, Terms: On lots of 500 lbs. and over, 60 days, or 95 for cash if paid in 15 days from date of invoice.	
Zinc, American, dry.....	4 1/4¢ 4 3/4¢
Zinc, Paris, Red Seal, dry.....	4 1/4¢
Zinc, Paris, Green Seal, dry.....	4 1/4¢
Zinc, Antwerp, Red Seal, dry.....	4 1/4¢
Zinc, Antwerp, Green Seal, dry.....	4 1/4¢
Zinc, V. M. French, in Poppy Oil, Green Seal:	
Lots of 1 ton and over.....	12¢
Lots of less than 1 ton.....	12 1/4¢
Zinc, V. M. French, in Poppy Oil, Red Seal:	
Lots of 1 ton and over.....	10 1/4¢
Lots of less than 1 ton.....	11¢
Discounts.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1 1/2; 25 bbls, 2 1/2; 50 bbls, 4 1/2.	
<b>Dry Colors.</b>	
Black, Carbon.....	8¢ 20¢
Black, Drop, Amer.....	3 1/4¢ 4¢
Black, Drop, Eng.....	7¢ 11¢
Black, Ivory.....	15¢ 21¢
Lamp, Comb.....	3¢ 5¢
Blue, Celestial.....	3 1/4¢ 8¢
Blue, Chinese.....	35¢ 40¢
Blue, Prussian.....	30¢ 38¢
Blue, Ultramarine.....	30¢ 35¢
Brown, Spanish.....	1 1/4¢ 1 1/2¢
Brown, Vandyke, Amer.....	1 1/4¢ 2 1/4¢
Brown, Vandyke, Foreign.....	3 1/4¢ 3 1/2¢
Carmine, No. 40.....	1 1/2¢ 1 3/4¢
Green, Chrome, ordinary.....	5¢ 6¢
Green, Chrome, pure.....	16¢ 20¢
Lead, Red, bbls, 1/4 bbls. and kegs:	
Lots 500 lb or over.....	6¢
Lots less than 500 lb.....	6 1/2¢
Litharge, bbls, 1/4 bbls. and kegs:	
Lots 500 lb or over.....	6¢
Lots less than 500 lb.....	6 1/4¢
Ocher, French Washed.....	1 1/4¢ 4 1/4¢
Ocher, Dutch Washed.....	4 1/4¢ 5¢
Ocher, American.....	7¢ 10¢
Orange Mineral, English.....	8 1/4¢ 11 1/4¢
Orange Mineral, French.....	11 1/4¢ 11 1/2¢
Orange Mineral, German.....	8 1/4¢ 9 1/4¢
Orange Mineral, American.....	8¢ 8 1/4¢
Red, Indian, English.....	4 1/4¢ 8 1/4¢
Red, Indian, American.....	5¢ 8 1/4¢
Red, Turkey, English.....	4¢ 6¢
Red, Tuscan, English.....	7¢ 10¢
Red, Venetian, Amer.....	100¢ 110¢
Red, Venetian, English.....	1,500¢ 2,100¢
Sienna, Italian, Burnt and Powdered.....	3 1/4¢ 9 1/4¢
Sienna, Ital., Raw, Powd.....	3 1/4¢ 7 1/4¢
Sienna, American, Burnt and Powdered.....	1 1/4¢ 3¢
Talc, French.....	100¢ 115¢
Talc, American.....	80¢ 110¢
Terra Alba, French.....	100¢ 110¢
Terra Alba, English.....	95¢ 110¢
Terra Alba, American No. 1.....	65¢ 85¢
Terra Alba, American No. 2.....	45¢ 50¢
Umber, Turkey, Bnt & Pow.....	2 1/4¢ 3 1/4¢
Umber, Turkey, Raw & Powd.....	2 1/4¢ 3 1/4¢
Umber, Bnt, Amer.....	1 1/4¢ 3¢
Umber, Raw, Amer.....	1 1/4¢ 3¢
Yellow, Chrome.....	10¢ 25¢
Vermilion, American Lead.....	10¢ 25¢
Vermilion, Quicksilver, bulk.....	65¢
Vermilion, Quicksilver, bags.....	65¢
Vermilion, English, Import.....	80¢ 95¢
Vermilion, Chinese.....	85¢ 95¢
<b>Colors in Oil.</b>	
Black, Lampblack.....	19¢ 24¢
Blue, Chinese.....	36¢ 40¢
Blue, Prussian.....	32¢ 38¢
Blue, Ultramarine.....	13¢ 16¢
<b>Brown, Vandyke.....</b>	
Low Grade.....	13¢ 15 1/4¢
Cabinet.....	13 1/4¢ 16 1/4¢
Medium White.....	14 1/4¢ 16 1/4¢
Extra White.....	18¢ 23¢
French.....	12¢ 40¢
Irish.....	13 1/4¢ 16¢
<b>Animal, Fish and Vegetable Oils.</b>	
Linseed, City, raw.....	gal. 50¢ 57¢
Linseed, City, boiled.....	58¢ 59¢
Linseed, State and West'n, raw.....	53¢ 55¢
Linseed, raw Calcutta seed.....	55¢ 58¢
Lard, Prime.....	47¢ 49¢
Lard, Extra No. 1.....	41¢ 42¢
Cotton-seed, Crude.....	28¢ 29 1/4¢
Cotton-seed, Summer Yellow, prime.....	29¢ 30 1/4¢
Cotton-seed, Summer Yellow, off grades.....	25 1/4¢ 26 1/4¢
Sperm, Crude.....	26 1/4¢ 27 1/4¢
Sperm, Natural Spring.....	26 1/4¢ 27 1/4¢
Sperm, Bleached Spring.....	26 1/4¢ 27 1/4¢
Sperm, Natural Winter.....	26 1/4¢ 27 1/4¢
Sperm, Bleached Winter.....	26 1/4¢ 27 1/4¢
Whale, Crude.....	26 1/4¢ 27 1/4¢
Whale, Natural Winter.....	26 1/4¢ 27 1/4¢
Whale, Bleached Winter.....	26 1/4¢ 27 1/4¢
Menhaden, Crude, Sound.....	26 1/4¢ 27 1/4¢
Menhaden, Light Strained.....	26 1/4¢ 27 1/4¢
Menhaden, Bleached Winter.....	26 1/4¢ 27 1/4¢
Menhaden, Ex Bleached Winter.....	26 1/4¢ 27 1/4¢
Tallow, prime.....	51¢ 52¢
Cocoonut, Ceylon.....	5 1/4¢ 6¢
Cocoonut, Cochin.....	5 1/4¢ 6¢
Cod, Domestic.....	34¢ 35¢
Cod, Newfoundland.....	36¢ 38¢
Red, Elaine.....	39¢ 40¢
Red, Saponified.....	57¢ 61¢
Olive, Italian, bbls.....	57¢ 61¢
Neatsfoot, prime.....	50¢ 52¢
Palm, prime, Lagos.....	5 1/4¢ 6¢
<b>Mineral Oils.</b>	
Black, 20 gravity, 25¢ 30 cold test.....	gal. 9 1/4¢ 9 1/2¢
Black, 20 gravity, 15 cold test.....	10 1/4¢ 10 1/2¢
Black, summer.....	11 1/4¢ 11 1/2¢
Cylinder, light filtered.....	14 1/4¢ 14 1/2¢
Cylinder, dark filtered.....	14 1/4¢ 14 1/2¢
Paraffine, 903-907 gravity.....	11 1/4¢ 11 1/2¢
Paraffine, 903 gravity.....	11 1/4¢ 11 1/2¢
Paraffine, 883 gravity.....	9 1/4¢ 9 1/2¢
Paraffine, red, No. 1.....	12 1/4¢ 12 1/2¢
In small lots 1/4¢ advance.	

# THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

## RATES OF SUBSCRIPTION: INCLUDING POSTAGE.

UNITED STATES AND BRITISH AMERICA.

Regular Edition, Issued every THURSDAY morning,	\$5.00 a year
Two Dollar Edition, large number FIRST and THIRD THURSDAYS of every month, Bulletin number each intervening Thursday,	2.00 "
Dollar Edition, large number FIRST THURSDAY of every month, Bulletin number each intervening Thursday,	1.00 "

## RATES OF ADVERTISING: ONE INCH.

ONE INSERTION, - - - - -	\$3.00	SIX MONTHS, - - - - -	\$45.00
ONE MONTH, (5 times) - - - - -	11.25	ONE YEAR, - - - - -	75.00
THREE MONTHS, - - - - -	26.25	Rates for larger spaces quoted on application.	

New York (Main Office),	232-238 William Street,	DAVID WILLIAMS CO., Pub'rs.
Philadelphia,	Forrest Building, 117 119 South Fourth Street,	THOMAS HOBSON, Manager.
Pittsburgh,	Hamilton Building, 335-337 Fifth Avenue,	ROBERT A. WALKER, Manager.
Chicago,	Fisher Building, Dearborn and Van Buren Streets,	H. H. ROBERTS, Business Manager.
Cincinnati,	Pickering Building, 5th and Main Streets,	GEO. W. COPE, Resident Asso. Ed.
St. Louis,	Chemical Building, 721 Olive Street,	HENRY SMITH, Manager.
Boston,	Mason Building, 70 Kilby Street,	C. F. WIELAND, Manager.
Cleveland,	The Cuyahoga, 311 Superior Street,	WALTER C. ENGLISH, Manager.
		EZRA S. ADAMS, Manager.

## AUSTRALIAN OFFICES: Melbourne, Hardware Chambers, 231 Elizabeth Street; Sydney, Palings Buildings

Remittances should be made by draft, payable to the order of DAVID WILLIAMS COMPANY, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

New-advertisers or Bookletters in any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.





